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ELECTRIC POWER

DOMESTIC USE OF ELECTRIC POWER

Yerevan PROMYSHLENNOST' ARMENII in Russian No 4, 1982 pp 22-25

[Article by Candidate of Technical Sciences L. V. Yegiazaryan and Engineer P. S. Manukyan]

[Text] The increase in the number of domestic electrical appliances has been geared toward satisfying the wants of contemporary man and providing comfortable conditions for his existence. In our country and particularly in our republic, domestic electrification is characterized by the use of electric power by the basic types of electrical appliances (refrigerators, televisions, radios, washing machines, vacuum cleaners etc.). At the same time, definite experience has been gained in using electric power to prepare food (with a two-fold reduction in the electric power usage rate). The advantages of using electric power lie in its cleanliness while it is being converted to thermal energy, its simple and safe usability and the considerably lesser amount of heat loss while using it.

At present in the republic, electric power circuits for residential buildings are being designed, taking into account the use of electrical appliances to prepare food. Contemporary conditions of improved standards of living are causing major changes in the proportion of electric loads in apartments, compared with the current calculated norms [1], which are based on research which is 10 years old. The appearance of these tendencies and the extent of change in the number of electrical appliances is interesting both from the standpoint of elaborating normative data for electric power usage as well as from the standpoint of long-range planning for increased domestic electrification.

In this regard, we have measured the expenditures of electric power and the magnitude of electric loads in modern apartments and residential buildings of the republic. The results of our measurements are cited in this article, as well as numerical data of a comparative analysis of the increased domestic use of electric power and a forecast for domestic use of electric power in the republic in 1990. This comparative analysis took into consideration actual conditions and a retrospective analysis. As is well known, the expected loads in a calculated forecast year can be determined with the aid of at least three types of mathematical and statistical models: cause and effect relationships, development tendencies and adaptive models for forecasting. Since the development of electrification in our country has a planned and regular nature, simple

models of development tendencies, are effective [2]. As a means of forecasting, we used the linear form of the model of development tendencies. Checking this form in a retrospective analysis of data on domestic electrification in the USSR during the 1960-1980 period showed that the linear form is suitable for a longrange forecast.

During our investigation of domestic electrical appliances in the republic, the objects of our measurements were different points of distributing networks of 10(6) and 0.4kV, supplying residential buildings (with 40 to 2,350 apartments), which had a different level of domestic comforts. The basic characteristics are provided in Table 1.

Table 1.

<u>Indices</u>	<u>Apartments with stoves</u>		<u>Apartments with electric stoves</u>	
	<u>Natural gas, Yerevan</u>	<u>Compressed gas, Noraduz</u>	<u>Yerevan</u>	<u>Razdan</u>
Number of apartments investigated	278.	62	182	37
Number of inhabitants per apartment	3.7	5.24	3.6	3.9
Average living space in m ²	30	67.2	32.3	36.2
Living space per inhabitant in m ²	8.1	12.8	9	9.3
Average established power per apartment, in kW	2.43	2.48	8.08 (2.28)	7.44 (2.24)
Average established power per inhabitant, in watts	660	473	2,244 (633)	1,908 (574)
Average established power per 1m ² of living space, in watts	81	37	250 (71)	206 (62)

The figures in parentheses exclude the power of electric stoves.

Comparing the corresponding indices in Table 1 and [2] demonstrates that over the course of 20 years, the average established power of electrical appliances increased by 1.44 kW per apartment in buildings with natural gas stoves. In apartments with electric stoves, the increase was 2 kW per apartment. Total average established power for an apartment's electrical appliances, excluding electric stoves, varies from 2.24 to 2.40 kW, with the lower figure corresponding to apartments with electric stoves.

Table 2 shows the make-up of domestic electrical appliances and the extent to which they have saturated apartments. As we see, the total established

Table 2.

<u>Domestic appliances</u>	<u>Power of appli- ances in watts</u>	<u>Prevalence of appliances</u>			
		<u>Apartments with stoves</u>		<u>Apartments with electric stoves</u>	
		<u>Natural gas, Yerevan</u>	<u>Compressed gas, Noraduz</u>	<u>Yerevan</u>	<u>Razdan</u>
Lights	60-75	7.04	6.54	8.65	7.35
Refrigerators	130-180	0.94	1.00	1.00	0.95
Electric irons	600-1000	0.92	1.00	0.98	1.00
Televisions	150-180	0.94	0.96	0.87	0.97
Washing machines	500	0.72	0.97	0.71	0.89
Vacuum sweepers	300-500	0.38	0.17	0.36	0.32
Floor cleaners	250-350	0.40	0.55	0.40	0.38
Radios	60-100	0.56	0.31	0.53	0.10
Electric radiators and other heating appliances	800-2000	0.19	0.34	0.07	--
Electric stoves	5100-5900	--	--	1.00	1.00
Other appliances	80-150	0.38	0.10	0.10	--

power of domestic electrical appliances when they are in full use varies within broad limits--from 3.3 to 8.5 kW, excluding the power of electric stoves. The power of lighting has increased considerably--on an average from 340 W [3] to 500 W and more.

At the same time, we have not reached in our country the optimum level in using electric power for food preparation, air-conditioning, electric heaters, etc.

Modern domestic electric power consumption in the republic has been determined with the aid of daily load schedules drawn up in typical inhabited areas and centers of electric power distributing networks. At the sites which were investigated, daily schedules were recorded for active power, current and voltage (over the course of 5-10 days in each season of the year). By analyzing these schedules, the proportionate expenditures of electric power for domestic needs were determined for two-room apartments in cities and three-room apartments in rural areas (Table 3).

Yearly expenditures of electric power were determined by taking the sum of seasonal expenditures, which in their turn were computed on the basis of daily load schedules for workdays and days off, taking into consideration that these schedules are repeated only during the given season.

Table 4 shows the measured expenditures of electric power in apartments with varying levels of domestic comforts. The data in Table 4 were obtained from the data in Table 3 by deducting the amounts of electric power expended to illuminate stairwells and confined areas and losses in the network (5-7 percent). To show the increase in domestic use of electric power, Table 4 includes the calculated relative expenditures from 1960 to 1970 [3,4].

Table 3.

Object of Research	Bus-bars 0.4kV	Bus-bars 10kV	Bus-bars 0.4kV		Bus-bars 0.4kV
	TP	RP	TP		TP
Stoves	Natural—	Gas	Electric		Compressed gas
Buildings	5-story, Yerevan	5 to 9- story, Yerevan	9-story and up, Yerevan	4-story Razdan	1 and 2- story in- dividual dwellings, Noraduz
Annual consumption of electric power by an average apartment family in kWh	2,410	2,050	4,100	3,950	2,900
Relative computed load of an average apartment family, in kW (95 per- cent accuracy)	0.78	0.58	1.56	1.43	1.06
Norm for relative load, in kW	0.45	0.39	1.1	1.1	0.69
Percent of excess of measured load above the norm	73	49	42	30	54

Table 4.

Consumer	Electric power expenditure in kWh per year					
	Per apart- ment	Per resi- dent	Per apart- ment	Per resi- dent	Per apart- ment	Per resi- dent
Apartments with natural gas stoves	730 (100-2300)	182	1200	300	2290	620
Apartments with compressed gas stoves	950 (100-2900)	238	1370	340	2760	600
Apartments with electric stoves	1800 (300-3900)	450	2200	550	3900	1115
Movable electric stoves	220	56	170	42	470	--
Illumination of stairwells	60	15.3	120	--	120-200	--

Limits of electric power expenditures are given in parentheses

An analysis shows that at present, relative domestic expenditures of electric power (as well as total established power of appliances) depend to a considerable extent on the level of the populace's domestic comforts and varies from 2,290 kW hours per year (in apartments with natural gas stoves) to 3,900 kW hours per year (apartments with electric stoves). In buildings with compressed gas stoves, the yearly expenditure of electric power for an average apartment family is 2,760 kW hours. Thus, according to calculations, for an average apartment family the annual expenditures for electric power in buildings with gas stoves is 22.6 rubles more than in buildings with electric stoves. These data were obtained for lead-ins into apartments and can be used to realistically evaluate anticipated expenditures.

In buildings with electric stoves, each resident uses an average of 1,115 kW hours of electric power per year; with compressed gas stoves, the usage is 690 kWh per year. During the past 20 years, compared with the unionwide average indices of 1960, expenditures of electric power by a single resident of a gas-supplied building in Yerevan increased by 3.4 times; in a building with electric stoves the increase was 2.5 times. Juxtaposing the results of the measurements with forecast data from 1960 [3] demonstrates that in Yerevan in 1980, the expenditure of electric power in a gas-supplied two-room apartment exceeds the forecast average unionwide level by a total of 15 percent.

According to the analysis which we conducted, there was a 52 percent increase in domestic electric power use and illumination in Yerevan from 1964 through 1980. By correlating the data in Table 5, one can determine that there should be a 16 to 31 percent increase during the next 10 years in relative expenditure for lighting and domestic power use.

Table 5.

	Years					Increase	Increase	
	1964	1969	1975	1979	1980	1970-1980	1964-1979	1990
Lighting and domestic use of electric power per resident as a percentage of the 1960 level.	100	134.4	155	181	204	--	81	--
As a percentage of the 1970 level	--	100	153.3	134.9	152	52	--	--
As a percentage of the 1980 level (forecast)	--	--	--	--	100	--	--	20-28

Systematizing the data for increased domestic electrical appliances and electric power use during the 1960-1980 period, and analyzing the investigation of apartments and the results of commodity measurements allows us to forecast anticipated relative expenditures of electric power for intra-apartment needs. In 1990, the yearly expenditure of electric power for one apartment family's domestic needs will increase by 15 to 25 percent, compared to 1980, and will be 4,850 kW hours for apartments with electric stoves and 2,650 kW hours for those with gas stoves. Thus, the anticipated increase in the relative expenditure of electric power for intra-apartment needs will range from 15 to 28 percent (21.5 percent will be the mean).

A comparison of actual measured loads with norms shows the increase in relative loads for apartments in the republic. According to the calculations, in 1990, when domestic life will be totally saturated with the basic electrical appliances and new appliances (air-conditioners, washing machines with hot water, freezer, dish washing machines, etc.) will be in general use, the average relative load maximum will be .93 kW in apartments with gas stoves and 1.68 in those with electric stoves.

It is obvious, from comparing the indices for electric power usage and the amount of electric appliances (Tables 1, 2, 3), that the domestic life of the rural populace today differs little from the life of urban dwellers. From that standpoint, and also supposing that all localities of the republic will be supplied with gas in 1990, the computed loads are forecast for apartments with natural gas stoves and electric stoves, taking into account that rural residences will be equipped with natural gas stoves and urban residence will be equipped with electric stoves.

Conclusions

1. During the past 20 years, the use of electric appliances by inhabitants of the ASSR increased, depending on the level of domestic life, by 1.44 to 2 kW for combined power of electric appliances, in an average apartment.
2. The values obtained for actual relative expenditures of electric power for domestic needs can be used when evaluating anticipated power expenditures by apartment families. Since it is economically advantageous (in accord with the mean indices) for apartment dwellers to install electric stoves for food-preparation purposes, electric stoves must be introduced more widely into domestic life.
3. The magnitude of the increase in electric power expenditure by a resident over the course of 20 years (compared with the average USSR-wide indicator for 1960) is 250 to 340 percent.
4. The average unionwide level of domestic expenditure of electric power, as forecast in 1960 for 1980 was less than the level actually measured in 1980 in Yerevan by 15 percent.
5. The increase in relative domestic expenditure of electric power in the republic in 1990 as compared to 1980 is expected to be an average of 21.5 percent.

6. The largest domestic load exceeds the normative level by more than 30 percent; therefore, the existing norms for relative loads must be reconsidered.
7. In 1990, the increase in relative domestic electric loads is anticipated to be 110 to 120 percent of the 1980 level.

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Abstract

This article describes the results of experimental research about domestic electric power use in the cities and villages of our republic. The increase in power consumption and in the number of domestic electrical appliances during the past 20 years is evaluated (compared with average unionwide indices). Domestic computed electric loads and relative expenditures of electric power are forecast for the ASSR in 1990.

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CSO: 1829/218

ELECTRIC POWER

LENINGRAD MINING INSTITUTE STUDIES THERMAL HEAT PROCESSES

Moscow PRAVDA in Russian 30 Jun 82 p 6

[Article by V. Molchanov and V. Senin, special correspondents of PRAVDA:
"The Depths Will Provide Heat"]

[Text] A Report from the Year 1990

The development of scientific bases for projecting and exploiting circulating systems that will allow the extraction of heat energy from hot mountain rocks has begun in the Leningrad Mining Institute imeni G.V. Plekhanov.

The city of Bezmyatezhnyy is drowning in gardens and parks. But this is not a resort area. From behind the leaves, buildings of plants and factories can be seen. The sky above them is clear; not a single little cloud of smoke or a trail of dust. And in addition, there are no chimneys. There is quiet and the smell of the forest is in the air. There is a sign at the edge of the town: "From the depths -- power." The artist depicted a crevice radiating beams of light....

We would look in vain for the city of Bezmyatezhnyy on the map. It lives in the science fiction story of Academician V.A. Obruchev, "The Heat Shaft," written in 1920. The hero of the story, engineer Arkadiy Yel'nikov, fulfilled his dream. The crevice reached glowing hot granite at a depth of 1,630 meters. Cold water that was inserted into the pipes came back to the surface as steam. "You will be able to service huge factories and a large city for practically nothing. The earth will heat boilers day and night," the project engineer fervently asserted.

V.A. Obruchev implemented the idea of the "underground boiler" within the walls of the Leningrad Mining Institute imeni G.V. Plekhanov. On April 30th, 1940, Pravda printed the Academician's responses to the May Day slogan: "I can visualize that in the next five to ten years the problem of utilizing heat from the depths of the earth will be resolved in practice. It will be an endless source of energy, and in the polar zone of the USSR cities, plants, and greenhouses will spring up, serviced by this energy."

The fascist invasion disrupted our peaceful plans and delayed the implementation of these creative ideas for many years. Today, V.A. Obruchev's students are working on projects on the basis of his ideas. In the Leningrad Mining Institute there is an applied scientific research laboratory for thermal physics of mining engineering. We were talking with its chief, Doctor of Technical Sciences Yuriy Dmitriyevich Dyad'kin:

"The earth's temperature increases on an average of one degree for every thirty meters. This means that at a depth of three kilometers, water could boil. But there are places where the hot rocks lie closer."

In front of us is a map of our country. Wavy lines follow the temperature of the depths. The Prikumskiy Lowlands, the North Caucasus, Stavropol'.... A two-kilometer-deep bore can reach massifs that are heated higher than 100 degrees. It will not be required to penetrate deeply underground in order to reach hot strata in the areas of Western Siberia, Central Asia, Kamchatka, Chukotka, Kaliningrad Oblast, and Lithuania.

"The energy potential of the depths," said Yu.D. Dyad'kin, "is locked in the ten-kilometer-thick upper stratum of the earth's core, and consists of many tons of conventional fuel. Only one percent of such reserves would guarantee all the energy that mankind would need for many hundreds of years...."

One of the maps shows places where geo-thermal energy is already working. For example, Reykjavik, the capital of Iceland, is warmed by underground heat. In the area of the Italian city of Larderello natural steam goes to the turbines of the electric power station. In our country, on Kamchatka, the Pauzhetskiy Geo-Thermal Station provides electric power.

"However, experiments for mastering underground resources," continued the scientist, "have so far, for the most part, not gone beyond the parameters of utilizing fountains of hot water and steam. This is merely the "cream" of geo-thermal energy."

....A piece of paper. The pencil of the scientist is drawing a so-called circulating system. The arrow, representing the bore hole, goes down to the hot stratum. Another slanting bore hole meets the first one, through which cold water is pumped from above. It would be good if at the end of the bore hole nature itself would provide a reservoir with hot walls in porous and fissured rocks. It would be filled with water coming down from the surface, and would return to the people already as hot water. A continually working reactor is formed underground, supplying us with heat without any expenditure of fuel at all. Such a system with an uninterrupted circulation of water was first proposed by the experts of the Tashkent Polytechnic Institute and the Institute of Technical Thermo-Physics of the Ukrainian SSR Academy of Sciences.

And what if the bore bypasses the hot granite and other solid rocks where there is no natural reactor for storing water? The scientists of the Leningrad Mining Institute are developing another variation: A reservoir can be formed by means of a hydrodynamic explosive in impenetrable huge rock masses.

This method is used by oil and gas workers in order to raise the effectiveness of old wells. With the aid of hydro explosives, a circulating system for a geo-thermal power station is planned in Trans-Carpathia and possibly near Leningrad.

Laboratory scientists are conducting their evaluations of resources and the selection of system parameters on the basis of economic-mathematical models that have been created here. Different types of bore holes are being tested in order to select the ones that are least expensive. An evaluation of the effectiveness of the heat extraction is being prepared in individual districts and for the entire country.

"Massifs at depths of 4 to 6 kilometers that are heated from 180 to 200 degrees," according to Yu.D. Dyad'kin, "are found in many parts of our country, and rocks that are heated from 100 to 150 degrees can be found almost everywhere at this depth...."

Today, technical drawings of circulation systems are being prepared. Places where underground thermal energy is projected to be used first are marked on the map. Symbols show the future geo-thermal power stations: Tarumovskiy in Dagestan, Kayasulinskiy near Stavropol', Zaluzhskiy in Trans-Carpathia, Avachinskiy on Kamchatka, and Aragatskiy in Armenia.

"A large part of conventional fuel," explained the laboratory chief, "is not used for electric power, but for heating cities. This is why in the long-range program in the USSR for mastering geo-thermal energy the emphasis should be on creating circulating systems for heating cities, as well as industrial and agricultural facilities.

A block of two bore holes can deliver from 20 to 50 million kilo-calories an hour to the surface. In other words, it could supply heat to houses where 10 to 15 thousand persons live, and in southern regions up to 20 thousand persons. The system, drilled through granite thicknesses near Leningrad to a depth of three kilometers, is capable of creating the necessary climate for growing vegetables on six hectares of greenhouses. The underground reactor will save at least 18 million cubic meters of gas per year.

Well drilling today is not a difficult task; we have a great deal of experience. But how can heat be transferred from the depths to the surface more economically? There are still many unanswered questions here. These problems are being worked out by a number of scientific and construction collectives in our country, together with the Leningrad scientists.

"When do you think heat from hot rocks will begin to serve the people's needs?"

"I hope that by 1990 the development of an effective technology for extracting thermal energy from the depths will be completed," answered the scientist. "And then cities that were born in the dreams of the science fiction writer V.A. Obruchev will become reality. There will come a time when Maykop and Groznyy, Razdan and Klaypeda, Chardzhou and Tobol'sk, Liyepaya and

Kerch', and L'vov and Krasnodar will all convert to a heating system that is obtained from underground energy. Instead of smoking chimneys and boilers, there will be small columns next to the bore holes and pumping stations. There will be no need to have fuel storage or trains transporting coal to boilers...."

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CSO: 1822/236

ELECTRIC POWER

ORGANIZATIONAL PROBLEMS DELAY CONSTRUCTION ON NERYUNGRI GRES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Aug 82 p 2

[Article by Special Correspondent Ye. Panov and L. Rybakovskiy, editor of INDUSTRIYA SEVERA: "The Summer is Short in Neryungri. Cause of GRES Construction Slowdown"]

[Text] Neryungri, Yakut ASSR--It rains a lot in Neryungri in the summer. Too much. Black clouds wheel round and round the depressions and the rain pelts down until the ground is soaked. The sun peeks out for a little while, then the storm clouds come again without warning and the rain comes down incessantly... It's a real bother to construction workers on the Neryungri GRES.

Hardly a day goes by that brand-new parts of the Leningrad turbine and Taganrog boiler intended for the first phase of the power plant aren't soaking in the street.

"You can see we've done our best to accommodate the equipment" says A. Shvartsman sardonically. He is the chief of the fuel and transportation department of the GRES that is under construction. "It has been stacked on the ground as carefully as possible."

"I don't believe equipment of this kind was ever stored in such a way" chimes in G. Druzhinin, chief of the future power plant. "What can I say? It's barbaric."

Whose fault is it? The builders', of course -- the power plant personnel have no doubts on this score. The heavy equipment should have been put into a warehouse at the beginning of the year, and now work on the project has actually stopped. But the chief of the construction administration, V. Kamenev, has a ready counterargument: the suppliers are at fault. There are no panels, beams, roofing. What has the general contractor been doing? After all isn't his business to see to uniform supply? A reasonable question. How has such a situation come about, with no place for the turbine to winter over?

It would seem logical to dispatch equipment right from the railroad cars to installation in the main building. But as things are now, you can look right through the main building. There are no wall panels. The foundation blocks have not arrived, and no one knows when they will. Is it the builders who are

at fault here as well? It would seem that it is not only the builders. The main problem here is shortcomings in direction. Planning estimates are provided to the builders late, and besides are of low quality. According to the blueprints, some plates are to be supported by air. Girders and joists are not shown.

You can't get anywhere with the Novosibirsk Department of "Teploelektroproyekt" [TEP] Institute, complains G. Druzhinin. On the building alone, the designers "forgot" 120 metric tons of metal. And another 900 were "lost" on the cable boxes. Where do we place our orders now? Where do we find the extra time to make and transport them?

Let us imagine for the moment that the building is finished. Can we go ahead and install the equipment? No. The turbine has arrived incomplete. Speaking in luggage-transport terms, there are six places missing, and one of them is a part of fundamental importance. Where is the missing equipment? Is it still at Leningrad Metals Plant? Has it got stuck on the way? Does it exist at all?

It should be said that despite their difficult circumstances, the builders have not done so badly. They have marked out the ground for the GRES. The twenty-story main building has been erected, the smokestack is up to the forty-meter level, 3000-ton tanks have been provided for oil and mazut storage, a 220/110 V open-air distribution unit has been installed, the dam is nearing completion, and so is construction of water collectors, and the reservoir is starting to fill. The town of Serebryanny Bor has sprung up for builders and power workers...

But a lot remains to be done. At least a lot is called for in the plans. For example, introduction of the first power generating unit was initially planned for 1978. Then it was moved back three years, and now the first start is planned for 1983. And can it be that none of those taking part in the construction is responsible for these endless setbacks?

Of course, no one at any time has ever built such an enormous fossil-fuel electric plant (power of the first phase 630 megawatts, of all six generating units -- nearly 1,300) on such a remote, northern, unlivable frontier. The estimated cost of this complex engineering project is 580 million rubles. However, such scales have required a corresponding level of support, primarily organizational. In the meantime, organization has been lagging from the first day, and is still limping along. Its untimeliness can be attributed mainly both to the two previous setbacks of startup of the first generating unit, and to the current problems on the construction site, including the sad story of the turbine.

And here is what is paradoxical. Glavseverovostokenergo (an administrative board that includes the directorate) is the client. "Bratskgesstroy" (a trust that includes the construction administration of Neryungri GRES) is the general contractor. Subcontractors are "Vostokenergomontazh", "Gidroenergomontazh" and others. All these are subdivisions of the same ministry. The USSR Ministry of Power is itself the planner, the builder and the future operator of the power plant. That is, it is acting in its own behalf, and not for anyone else.

Why is it that comrades cannot agree with one another? Why have the efforts of allies driven them apart rather than pulling them together? Why, we ask, have the directors of Novosibirsk Department of TEP so far failed to satisfy the document signed by three chiefs of main administrations and obligating the planners to submit all documentation on the first power generating unit by the first of July? Most likely because the Power Ministry has not been the real boss of the project on putting up the power plant.

The subdivisions taking part in the construction of the GRES cannot find a common language. Their experienced directors have explained: the worst kind of bureaucracy is the bureaucracy inside an agency. Intraministerial.

Let's talk to work superintendant of the Zeyskiy Millwright Section of "Gidromontazh" Trust, A. Ivanov.

"A firm ruling hand must be sensed in everything" he says. "So what is the problem? There is a boss -- the general contractor, the construction administration. But when you run up against a pressing problem, what do you hear? That you're supposed to go to somebody for this and to somebody else for that. I don't need a reference, what I need is an on-the-spot answer to my problem!"

The slogan posted on the construction site, "Let's Finish the Main Building Before 1 October 1982", applies directly to the hydraulic equipment installers headed by A. Ivanov. And even earlier, in September, the heating duct of the building must be installed and must be supplying heat.

The project is running out of time. Time lost cannot be made up. Before you can turn around, winter will be here. The summer is short in Neryungri.

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ELECTRIC POWER

SECOND STEAM-GAS UNIT NOW OPERATIONAL AT MOLDAVIAN GRES

Kishinev SOVETSKAYA MOLDAVIYA in Russian 1 Aug 82 p 3

[Article by L. Dmitriyev: "Footsteps to Eminence. Second Steam-Gas Facility Goes Into Operation at Moldavian GRES Three Months Ahead of Schedule"]

[Text] Lights on panels began to blink, the floor under our feet gave a heavy rumble, the noise of the turbine merged with applause as the first unit of the plant started producing electric current. The work shift of the Moldavian GRES started from this instant.

This was in the autumn of 1964. The job at that time was maximally clear: the builders and millwrights were to put one machine after another into operation, and the power engineers were to take over the facilities and operate them strictly according to instructions and timetables. But such is the nature of the Soviet citizen: literally from the first day of life of the new plant every engineer and worker, technician and foreman was thinking not only about how well he could cope with his own narrow duties "coming and going." From the very beginning, the operators took upon themselves the concern for raising the efficiency and improving the reliability of the machines.

The Moldavian GRES operates on fuel imported from afar, which cannot but have its effect on the cost of producing electric power. Therefore it is natural that the collective turned its immediate attention to problems of fuel economy and reduction of energy expenditures for internal needs. For example, the ball charging of mills was optimized, as well as the number of working stages of feed pumps depending on the 24-hour schedule at the plant. This brought about the most efficient expenditure of electric power and sharply reduced fuel consumption for each kilowatt-hour.

And there is certainly no need for a scrupulous listing of names and addresses of the enterprises that assisted the Moldavian power engineers in their pre-deadline introduction and mastery of the energy capacities of the GRES. Dzhezkazgan copper or Kuzbass steel, Baltic plastic or local concrete made with Rybnitsa cement, all the thousands of diverse structural members and components have been intertwined here in the building of the GRES. It is all intertwined and there is no use looking for figures on the amounts of metal structures or instruments supplied to the plant. Friendship is not measured in numbers.

Nonetheless, a few are indispensable. At that time in the mid sixties when the name "Moldavian GRES" showed up on the portfolio of orders at Leningrad Metal Plant, no one even thought of calculating the exact date of their future joint triumph. An order is just an order. There was nothing complicated about it. The usual "200's" that had already become base units. The usual parameters. Everything as usual. The first, second, sixth,... the tenth turbine.

And then it turned out that the eleventh turbine for the GRES would be a little unusual. Or to be more exact, even experimental. It was to operate in a unified mode with a steam-gas facility, a turbine which the Leningrad plant was also to make. There was a brief meeting in the bay of the 21-st steam-turbine shop and it was decided to fill the order of the Moldavian power engineers ahead of schedule.

The same obligations were taken on by the Khar'kov and Taganrog collectives, which appreciably shortened deadlines in delivering the generator and steam boiler.

All this enabled the builders and millwrights of the SMU [expansion not given] at the Moldavian GRES to put the first PGU-250 (the abbreviated name of the new steam-gas facility) on line last autumn. The technological parameters of the steam-gas facility enabled production of an additional 40,000 kilowatts of electric power. We mention in passing that this was the initial total capacity of the Dubossary GES. Moreover, and this is especially important, the new unit quickly covers daily "peak" loads: the facility can be brought up to operating conditions in less than ten minutes.

Following the first steam-gas turbine, work started on building the second, which was to operate in conjunction with the twelfth power unit. According to plan, it was to be put on line in September of this year, but precise engineering calculations, industrialization of work, and able use of their own rich experience enabled the collective to put this important facility into operation three months ahead of schedule.

"And all the same" says GRES Director G. P. Kior, "our own efforts would not have sufficed had it not been for our numerous allies who came once again to our aid. We received equipment ahead of schedule from Leningrad and Khar'kov. Zaporozh'ye, Belgorod and Taganrog responded to the pleas of the Moldavian power engineers. The workers' relay race provided a mighty impetus on the worksite."

Many of those who constructed this vital facility are Dnestrovsk veterans. They started here when the first peg was driven, dug the foundation pits for the columns of the main building, put in the first roads, poured the concrete for the foundations of all twelve power units. One such is masonry team leader V. Rashkovan. His team is the *crème de la crème*. He began work here as a young team leader twenty years ago. He is a concrete finisher and carpenter, mason and asphalt worker.

Rashkovan's team was a driving force in the construction of both steam-gas turbines. No one can recall a case where this collective did not handle its

assignment, or did not finish with "highest marks." Time cannot diminish the fame among workers on the construction site of teams led by A. Kozlovskiy, A. Lachkov, Ye. Azarenko, N. Serebryakov and I. Cherednyakov. They have shown themselves to be talented organizers and able leaders. A creative approach to work and the striving to do it quickly and well are the earmarks of veteran team leaders.

The labor of builders, millwrights and operators and their numerous allies has been crowned with success. Georgiy Pavlovich Kior spoke about the outlook for improving the plant, about the tremendous benefit to the national economy that will be brought by the new facilities, about plans for a sharp reduction in fuel consumption.

A few days ago the science and engineering council of the USSR Power Ministry held a meeting at the GRES. Taking part in the session were representatives of research and design institutes, "Orgenergostroy" and all manufacturing plants that supplied equipment for the steam-gas units.

The participants in the meeting unanimously noted that the collective of the Moldavian GRES has done a great job in putting the PGU-250 into operation. Step by step, every worker at the plant is rising in development. In evaluating their excellent work, they find fault (of course in the positive sense of the term), singling out weak aspects of individual units, analyzing the components of efficiency of aggregates together with plant specialists and scientists, thinking about what and how to improve.

The introduction of two steam-gas turbines at the Moldavian GRES is already giving an appreciable return. For example the specific heat consumption by each unit has decreased by six percent. The result is a reduction by 25,000 metric tons in annual fuel consumption per turbine.

The configuration of the PGU-250 as compared with the conventional design has considerably reduced both the construction volume and the staging area. The result has been a reduction in the cost of construction and millwright work by nearly 500,000 rubles, a savings of 680 metric tons of steel and 1100 cubic meters of reinforced concrete, and decreased labor inputs by 16,000 man-days.

And perhaps the main thing: the Moldavian experiment has demonstrated a base for further development of economic and highly maneuverable energy-producing units with high power.

...It was nighttime as we drove away from the Moldavian GRES. It was alive with lights. It had been a pleasure to visit with people whose aspirations, efforts and drive are not limited to the scope of the current plan and today's concerns, whose prosaic duties have become equivalent to a high professional obligation.

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ELECTRIC POWER

LESSONS OF EKIBASTUZ GRES-1 CAN HELP IN BUILDING GRES-2

Moscow EKONOMICHESKAYA GAZETA in Russian No 35, Aug 82 p 13

[Article by Team Leader A. Stepanov, "Sredazenergomontazh" Millwright Administration: "What's Troubling Millwrights. Strong Rear Lines for Ekibastuz GRES Construction"]

[Text] Experience accumulated in construction of the Ekibastuz Fuel-Energy Complex has been instructive, and doubtless will be useful in other areas of the nation. On this project solutions have been found for a number of complicated engineering problems, practice in organizing construction and millwright work has been enriched, a considerable contribution has been made to coordinating the activity of various ministries and agencies on the scale of the entire complex.

At the same time, we must not overlook the inadequacies that slow down construction of electric power plants. For example, all power units of Ekibastuz GRES-1 are being put into operation with a delay past the set deadlines. There have been considerable nonproductive expenditures and losses in the course of construction. All this is cause for concern. This is why I have decided to make some of my own comments and considerations.

As installers of heat-producing equipment, we millwrights are especially aware of dereliction in the organization of delivery of equipment to the construction site. At one time it had been planned to set up a large comprehensive industrial base at GRES-1, where incoming boiler units, turbines, pipes, electrical and other equipment were to be unloaded. But construction of this base was not started on time. Suffice it to say that the work on the construction yard was started at the same time as on the main power facilities, rather than earlier as had been stipulated. And what do you think happened when the equipment started flooding in from the suppliers?

As things turned out, there wasn't any place to put it. Equipment began to be unloaded on the yards at the Yermakovskiy GRES and Ekibastuz TETs, on the base of the production-process support administration of "Ekibastuzenergostroy" Trust, and sometimes just right out there on the prairie. In the confusion the equipment wasn't even inventoried, just stored where it lay. Thousands of hours have been wasted, and indeed are now being wasted by workers, engineers and technicians alike in looking for required items randomly dumped in different

locations. Some of the fittings and pipes have suffered damage as a result of improper storage.

Such has been the situation with regard to delivery of equipment for GRES-1. And I am concerned lest we face a similar situation with delivery of boiler units, turbines and other equipment for GRES-2.

The first consignments of process equipment will shortly begin arriving. And once more due to the lack of completed yards at GRES-1 there will be nowhere to put these consignments. And this means that there may be a repeat of the same confusion that reigned in construction of the first power plant.

There are serious doubts about the planned method for delivery of large and heavy consolidated units by truck -- trailers and tractors from the regional motor pool. Still fresh in my memory are the unsuccessful attempts to use them in construction of GRES-1. Transport units designed by the Odessa Affiliate of "Orgenergostroy" Institute were made for hauling 100-ton boiler units, but they were not suitable. Now two trailers that cost 120,000 rubles apiece are standing idle.

The access road over which equipment is to be hauled to GRES-2 has been designed in such a way that there is a 26 cm space from the wheel to the shoulder. What does such a small distance mean for huge trucks that are difficult to steer? The slightest deviation from the center of the route, which is not at all impossible under icy conditions, and the platform may overturn with all the resultant consequences.

The necessity arises of re-examining the methods and means of delivering equipment to GRES-2. I have already said that the unloading area of a regional comprehensive base was to have been built at GRES-1. But since this project was never completed, the idea arises of building unloading yards at GRES-2. What do we achieve in such an event? First of all, we avoid overloading of equipment on the yards at GRES-1. Secondly, the units would be transported by rail directly to the power plant under construction from the manufacturing plants.

Placement of consolidated assembly yards at GRES-2 is advantageous in all respects. Estimates by specialists with whom I have consulted show that organization of a trans-shipping base at GRES-1 will involve additional transport expenditures to the tune of about two million rubles.

We are particularly concerned about the assembly and consolidation of large modules. A special millwright operations (SMO) building has been designated for these jobs. It has been planned by the Leningrad Affiliate of "Energomontazhproyekt" Institute (chief engineer of the institute is A. Shchagin and chief project engineer is L. Bulanov; department head is Yu. Reshetov). According to calculations of the institute, the removal of metal structures will be 4.7 metric tons from a square meter of production area per year. But this figure of the institute is overstated. We are now removing 0.15-0.17 metric ton of metal structures per year from a square meter, which is 30 times lower. The institute has figured that it takes 2.1 hours to fit one metric ton

of high-pressure pipelines; in reality it now takes 6 man-days. We do have unused reserves, we know that. But they are not nearly as great as assumed in the plan.

Manufacturing plants consign heat-producing equipment to Ekibastuz without assembly precheck. We have to do this work on the spot, eliminating the deviations from blueprints. But somehow, the specialists at "Energomontazhproyekt" have failed to account for such additional work.

In criticizing the plan for the SMO building, we should not fail to mention the following items. Assembly of units with height of 12,960 mm is stipulated, but because of design miscalculations, the building will accommodate pieces no larger than 10,400 mm.

On paper, we have a building for assembling and installing 45,000 metric tons of equipment per year. However, we are handling only 5,500 metric tons. We need a realistic figure, not some "blue-sky" idea.

There is every reason to believe that the SMO building will not be able to meet the requirements of heating equipment installers' organizations during construction of GRES-2, and for that matter GRES-3. And we must take immediate steps to unplug the bottleneck.

There is another troublesome problem. Design institutes have suggested production-line installation with self-propelled hoisting rigs. These can deliver modules from all sides of the erection site at the same time. This would be wonderful, but we have no such rigs at our disposal. When we talk about this to the designers, unfortunately they do not want to hear our arguments. We are all for putting new progressive ideas into practice, but are categorically opposed to using half-baked assembly technology that does not jibe with specific conditions.

We are on the brink of starting installation of heat-producing equipment at GRES-2. We must get the utmost out of the lessons of doing this work on GRES-1 so that we do not repeat our previous errors and blunders.

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ELECTRIC POWER

SOLAR ENERGY INSTITUTE IN ASHKHABAD

Moscow SOVETSKAYA KUL'TURA in Russian 8 Jun 82 p 8

[Article by V. Svirin, special correspondent: "The Desert Promises Comfort." Passages enclosed in slantlines printed in boldface.]

[Text] Using the sun's energy is the task of a unique scientific production society established in Turkmeniya.

"What comfort? What are you talking about? Have you ever really seen a desert even once? A real one? The kind where the sand is so hot that if you extend your hand toward it, your palm will be burned as if by a flame? Where the sand dunes are so curving that you can walk around for a whole day and at the end you will realize that you have been stamping around in one place. This has happened with inexperienced people. As a matter of fact, some do not even last a day; after all, there is not a drop of water around, and with 45 degree heat, nearly a liter of moisture evaporates every hour from the skin's surface...."

The above monologue could be spoken by any one of us who has read and heard so much about the harshness and insidiousness of deserts. And all this is true. But wait a minute now: People live and work in this destructive heat. They drill wells for oil and gas and shepherd millions of sheep. And the person I was speaking with, Redzhep Bayramov, General Director of the "Solntse" Scientific Production Society and Academician of the Turkmen Academy of Sciences, was born in the desert. Son of a shepherd, he tended flocks of sheep himself to the age of fourteen, from three to nine at night, when a person can breathe with relative ease and the oppressive heat does not exhaust the animals.

"And in 1943," says R. Bayramov, "we received news that my father had been killed in a battle in Staraya Russa, and I was sent to a boarding school. Then I completed my studies in physics at the University, studied as a graduate student, and defended my theses for the candidacy and doctorate...."

He knows the desert and contends that it is a land of bounty! And if it were to be populated, used, and built up, it is difficult even to speculate how much it could provide for the state.

The "Solntse" Society is working specifically on creating green oases in the searing sands. "In my youth," reminisces Bayramov, "my mother would sometimes say that our neighbors -- but their tent was more than ten kilometers away -- have moved to town for good. Why, I wondered. Do they live better in town? But no, there is another reason: you come back from work, take a shower, go to a movie, read a book, and suddenly you are not tired at all. It would be really good for the nomadic shepherd, the tractor driver, and the cotton grower to come home, wash off the dust eaten into the skin, and sleep at least two hours, but in a normal temperature. Two hours and your strength is regained.... This is why we are striving to secure not only tolerable, but to a certain degree even comfortable conditions for those working in the desert. We hope to do this with the help of the sun. We are exploiting the sun. We invent, construct, and calculate all possible solar devices, test them, and put them into operation."

In order to understand how the sun is being used here, we would like to cite an example that is widely known among experts: If one could collect without any loss all the energy of the sun's rays that fall on the earth's surface within a period of two weeks, it would equal all the reserves of the traditional forms of fuel. This example can be made more specific by another one: If one takes the roof of an ordinary bus that is driven, let us say, in a Central Asian desert, and replaces the roof with a solar device that ideally catches and converts solar rays into energy, it would save ten liters of gasoline every day.

But thus far this is not possible. What is possible then?

An experimental three-story building with a solar technical microclimate system has been built on the grounds of the Institute for Solar Energy, which is a part of the Scientific Production Society. The experiment was a success, and now there are four buildings with 128 apartments each in Ashkhabad that have been equipped with a similar air-conditioning system. The same principle will also be applied in the solar town located in the settlement of Cherkezli in the Kara-Kum, the construction of which has just started. Here, the sun will be "ordered" to cool the little houses of the animal breeders.

Incredible? Our readers, however, probably have not forgotten the small household "Sever" air-conditioners that were manufactured not too long ago. Ammonia was circulated in these air-conditioners, heated by electricity or a gas burner, it evaporated, and cooled the room.

Replace the heat source by the burning sun, and there is nothing fantastic about it. Of course, scientists of the institute declined to use ammonia, selecting solutions of lithium bromide or calcium chloride, and the cooling radiators were built into the ceiling and floors.

/Such an innovation is priceless in a hot climate, and not only because of its beneficial effect on man's condition and well-being. There is another important factor: It is now possible to preserve rapidly perishable products for a protracted period of time in the summer desert./

The sun is "predestined" both to heat the small solar town in the wintertime and to assure its inhabitants of a hot water supply. In R. Bayramov's explanations, using as an example the institute administration building where we were talking, this process is not complex at all. It begins between a heat-absorbing surface and a heat exchange unit, a flat wooden or metallic box filled with black material that actively absorbs the sun's rays. The box contains pipes filled with water whose temperature reaches a total of 65 degrees. And if one uses a box the size of, let us say, a dining room table, it can save 200 kilograms of coal per year.

/Nevertheless, this only seems simple. Experiments on several types of solar water heaters were conducted by many academic and government institutes of our country for two years on the proving grounds of this institute. The term "several" speaks for itself. Hopeful results were obtained, as well as one major result: The utilization of apparatuses for supplying hot water and for cooling buildings will save over 600,000 tons of conventional fuel annually, that is, forty-five per cent of the general fuel needs that the republic uses for these purposes. But perhaps the main point lies elsewhere: Over one-half of the three million population of Turkmenistan is dispersed throughout the vast desert expanses having a density of five persons per square kilometer, and it is cheaper to deliver self-contained apparatuses to them than coal, wood, or kerosene./

But there is a stumbling block in this: water. A drop of water in the desert is worth its weight in gold. People need it, but even more so, sheep require it. And there are one thousand sheep in every --every!-- flock. Water is transported for them from twenty to thirty kilometers away.

And what if water pipelines are laid? It is expensive: The cost of a cubic meter of water is nearly three rubles. What if irrigation ditches are extended? This is not very effective, because evaporation of water in the desert is so intensive that a pail of water poured in the morning and left in the baking sun will be empty by evening.

"Then," continued the general director of the society, "we decided to obtain water from the underground salt water reserves. For all practical purposes they are everywhere. We dug the first well in the atypical terrain of Obez-Shikh for the 'Bakharden'Sovhoz and erected a solar water distillery next to it. It justified itself..."

/To those readers who have been in the city of Shevchenko and know that the city is fully supplied with water, desalinated in industrial quantities by a powerful apparatus, which by all rights could be called a plant, this information given by R. Bayramov will not appear to be something unusual. But this is the whole essence: From available material, window glass, concrete, and metal, unheard of apparatuses are put together, which from afar look like hotbeds with only one exception, which is that their glassed-in frames have an exactly measured angle of declination. Water vapors from the salt solution heated by the sun condense on the inside surface of the frames and drip into small containers./

"Well, what is the productive capacity of the water distillery?" I asked.

"It depends on the area. One cubic meter will give one cubic meter of desalinated water per year. This is entirely sufficient."

"And how reliable is it?"

"In Turkmenia, with the aid of solar rays, it is possible to obtain desalinated water 280 days a year. The rest of the time, a reverse procedure is used: freezing."

At first glance this is not very clever technology. However, preliminary calculations are startling: If in Southern Kazakhstan and Central Asia around 9,000 such apparatuses were to be built, they would "bring" nine million cubic meters of water per year and would allow an increase in livestock of nine million sheep. And this addition would mean 25.5 thousand tons of wool, 86.4 thousand tons of mutton, and nearly three million karakul skins. And furthermore, a quantity of water distillers such as this would save the state 125,000 cubic meters of gasoline, which would be needed for automobile transport in order to deliver water to the pastures.

In the small solar town mentioned above, scientists of the Scientific Production Society "Solntse" will also use solar energy in greenhouses with a sealed water circulating system. Not going into technical details, I would just like to say that in similar experimental greenhouses dill and parsley, watercress and sorrel, cabbage, cucumbers, and tomatoes have been grown successfully. They also had high yields of lemons, up to three hundred fruits per bush, without using auxiliary heat. We compared the cost of production in the solar and in an ordinary lemon hothouse, and it turned out that it was only half as much in the solar.

/The small town in the atypical terrain of Cherkezli was conceived by planners as a place where various types of solar energy converters, already approved in laboratories, proving grounds, and households of the republic, are concentrated in one location. With regard to a standard of conveniences, it will not take second place to a modern city apartment for a family of four; and with regard to the plot of land, it is really like a farm where one may, if he wishes, have both a swimming pool and a man-made reservoir with fish. Of course, in order to feed the fish one would have to build a structure for an accelerated reproduction of [chlorella], the tiny algae which are rich in albumen. Such a [chlorella] factory is now functioning at the society institute, periodically supplying the neighboring economy with an excellent supplement to the animal food rations./

"Incidentally, what about dinner for the shepherds," I asked Bayramov. "And what about the popular hot green tea, which quenches thirst in the desert better than anything else? Is it prepared over a campfire? On a kerosene burner?"

"Why? There is a small solar kitchen made of several spherical mirrors. The position of the mirrors is regulated by the sun, the reflected rays are

focused on the pot or, if you wish, on a frying pan or a teapot. Six liters of water can be boiled in one hour."

"Well, and how about electricity? A television set cannot be turned on without it...."

/And here we encountered the problem of a solar electro-station. There are several variants. For example, a well-known one was invented in Uzbekistan. It feeds a light grid comprised of five to ten lamps. There is a French one that has a power of sixty-five kilowatts. There is one that is a steam turbine located on the proving grounds of the scientific production society headed by R. Bayramov. However, they are all low-powered and cumbersome. The problem could be solved by applying photoelectric generators as is done on spacecraft. There, the photo elements themselves convert light falling on them into electric energy./

"Thus far they are expensive." noted Bayramov. "And this is why they are searching for economically acceptable methods for converting solar energy into electric energy. I have no doubt that we shall succeed!"

"In other words, everything that you have listed is probably not inexpensive either?"

"It depends on how you look at it.... Economic and social concepts are often closely interwoven. The famous English scientist Brinkwort, as I remember, expressed the thought that a farmer will not acquire solar converters; he cannot afford them. Our solar complex is actually given by the state to the shepherd brigade, because in our case the shepherd is not an abstract person or an abstract figure, but a man working under difficult conditions for the good of society."

My interviewee is convinced that hundreds of such complexes will appear in the Kara-Kum Desert in the not too distant future. Even during the 11th Five-Year-Plan shepherd brigades from cultivated zones and large populated areas will arrive in these complexes on their way to stand their watch. The preliminary average cost of a solar farm in Turkmenia will not exceed 100,000 rubles, and the expenses will be amortized in 3.5 to 9 years, depending on its remoteness. Solar rays will also perform many tasks in cultivated zones. With the help of small apparatuses, power can be guaranteed for such productive activities as spinning, woodmilling, canning, and light industry. Drying vegetables and fruits, silkworm cocoons, and irradiating cotton seeds to have a better harvest, and the processing of daily waste is also the sun's professional duty. Experiments are being conducted that will have a great significance for Central Asia, Kazakhstan, Transcaucasus and North Caucasus, southern Ukraine and the Lower Volga region, where the climate is favorable for using solar energy. Scientists have calculated the following: The roof of a house fulfilling its role as a collector of solar radiation will activate a weaving loom or a turning lathe; the roof of a shed will activate a pump for irrigating tens of hectares of land. A device the size of a classroom blackboard will "activate" school radios and television receivers.

/These are not outrageous fantasies but vital necessities dictated by many circumstances. Among them are the rapid development of the chemical industry which produces newer and newer valuable products out of traditional forms of fuel, the reserves of which, incidentally, are not limitless. Among other circumstances is also the unprofitability of future transport of fuel. Finally, solar energy precludes the pollution of the environment./

Of course, there are many more objective reasons which motivate research in the area of solar technology. And the scope of its application is also immeasurably broader. In our conversation with Academician R. Bayramov, however, we touched only on one topic: What is already being done today to have everyday life and labor "be felt" in the desert.

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ELECTRIC POWER

SOLAR CONVERSION STATION IN KARA-KUM DESERT

Moscow TRUD, in Russian 9 May 82 p 4

[Article by V. Knyazev and A. Tychinskaya: "The Sun Gives Energy"]

[Text] The construction of stations for the direct conversion of solar energy into electrical energy has begun in the grazing pastures of the "40 Years of the Turkmen SSR" kolkhoz in the Kara-Kum Desert.

In these spring days Kara-Kum greeted us with soft green colors and waving fields of scarlet poppies. Numerous flocks of sheep have gone out to the grazing pastures. Here, several hundred kilometers from the central farmstead of the kolkhoz, the shepherds keep their watch. Their labor is not easy, and this is why scientists have been thinking for a long time about how livestock breeders could be helped in watering multi-thousand numbered flocks in the desert. This is the main problem in the Kara-Kum.

In recent times electric motors have been used to lift water out of deep wells. But it is really impossible to extend electric power lines [LEP] into every district of the desert. Coming to the rescue was - the sun. Scientists of the Turkmen main laboratory of the All-Union Scientific Research Institute for Power Sources have built miniature power stations which convert the sun's heat energy into electricity.

Literally in front of your eyes a device is assembled that resembles a radar antenna. This is the station itself. It can be easily transported from one district of the desert to another, following a flock, and assembled within one hour. For all practical purposes, the station can operate the year round. After all, in Turkmenia there are nearly 300 sunny days out of every 365 days. Well, what if cloudy weather occurs despite all this? Scientists have also anticipated this. The station built by them is insured by the blades of a windmill that come alive with even a slight puff of wind.

A real yurt is also a part of the station complex. Its cupola girds several solar batteries. They also convert solar energy into electricity, but autonomously from the station. There is enough electricity for uninterrupted usage of any common apparatus and, if necessary, even for churning butter or shearing sheep.

Let us, however, return from the desert to the laboratory. Its chief, Candidate of Physical-Mathematical Sciences B. Bazarov, is speaking:

"Our main task is to implement a close tie between science and production. We construct everything ourselves and create southern versions of apparatuses invented in other subdivisions of our institute and the laboratories of the 'Kvant' Scientific Production Society. We have received orders for producing tens of integrators for stray currents from the 'Turkmengazprom' All-Union Society and from 'Turkmenglavenergo.' In a matter of seconds the new apparatus can determine the rate and extent of corrosion in metallic LEP structures and in gas pipelines. It is also irreplaceable in laying these lines, because it can tell the builders at which points the metallic structures will be less subject to corrosion. We are also developing a solar electro-station for feeding radio relay lines of communication along the Central Asia-to-Center gas pipeline."

Together with colleagues of other organizations of the Turkmen SSR Academy of Sciences, the laboratory collective is creating essentially new devices for detecting and forecasting earthquakes in seismologically active zones. Based on new principles of indicating physical fields and on the latest discoveries in the field of molecular electronics, these devices will be highly sensitive.

Our excursion through the laboratory ended and we walked out into the sun-drenched street. A minibus [rafik] drove up to the entrance.

"It is not quite the usual thing," noted B. Bazarov, asking us to get into the vehicle. The microbus began moving smoothly and quickly gathered speed. In all this, there could not be heard any engine noise at all. It turned out that the vehicle works on solar batteries installed in its top. At night, the engine gets its power from a special "filling station" which collects energy during the day.

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CSO: 1822/235

ELECTRIC POWER

SOLAR CONVERSION OPERATIONS IN TUSSR DESERT

Moscow IZVESTIYA in Russian 25 Jun 82 p 2

[Article by A. Blokhnin and V. Gavrichkin, special correspondents of IZVESTIYA : "Radiant Energy"]

[Text] The first two industrial solar complexes are being built by workers of the "Solntse" Scientific Production Society [NPO] of the Turkmen Academy of Sciences and the Turkmen branch of the All-Union Scientific Research Institute for Power Sources (NPO "Kvant"). The first solar town for shepherds began to be built on the atypical terrain of Cherkezli in the middle of the Kara-Kum Desert and the second, in the grazing pastures of the "40 Years of the TuSSR" Kolkhoz area.

The desert sun quickly stifles the short burst of springtime green with its powerful heat. Only two weeks ago, poppies glowed even among the sand dunes, but now the colors have become dull. And it seems that the thick, intense heat does not bother only the lively small lizards frolicking in the yellow drifts.

But suddenly a bright object is interwoven into this barren, monotonous landscape: a narrow strip on the horizon sparkles with a crystal-like glitter in the sun's rays. Is it water?

Soon, however, the "mirage" vanishes. What we first thought was water, actually has the most direct relationship to water, but so far does not contain even a drop of moisture. These are the glassed-in "honeycombs" of the water distilling apparatus - the main structure of the sheep-raising solar complex in Cherkezli. Life will give it that same furious sun that burned out everything for hundreds of kilometers around.

In the wintertime it will warm the small houses of the animal breeders and during the oppressive summer heat it will cool them. A motor will lift salt water out of a well and all everyday appliances will work on electric power obtained with the help of solar batteries. The sun will provide "fuel" for the kitchen, heat water in the shower assembly, and grow vegetables in a hothouse that has a sealed water-circulating system.

The Director of the "Solntse" [Sun] Society and Corresponding Member of the TuSSR Academy of Sciences Professor R. Bayramov, believes that the future conquering of deserts lies in such autonomous solar complexes. They will guarantee that animal breeders, who live far away from populated areas for long periods of time, will be provided with energy, water, and vegetables.

The "Solntse" NPO and the Turkmen section of the All-Union Scientific Research Institute for Power Sources can be called "sunshine neighbors." They have spread their experimental proving grounds in the small town of Bikrova, near Ashkhabad. Here they have, among other things, test stands for the direct conversion of light energy into electricity, filled with cassettes having semi-conductor elements that give off a blue gleam; and fantastically formed transparent photoreactors for growing [chlorella]; and solar high-temperature ovens that can smelt metal samples having the high degree of purity that is unattainable to other forms of metallurgy; and a whole collection of various kinds of water heaters.

The 25 laboratories of the "Solntse" NPO and the 8 Turkmen "Kvant" laboratories are working in Ashkhabad on the practical implementation of a program to master renewable sources of energy (in this case - solar), a program that was developed by the USSR State Committee for Science and Technology.

"Solar technology," says B. Bazarov, chief of the Turkmen section of the All-Union Scientific Research Institute for Power Sources, "is no longer at the stage of consisting of unique and exotic experiments. Today, a new branch of industry is actually being born that will make it possible for us to begin applying solarization to some manufacturing, which will result in a noticeable replacement of traditional types of fuel by solar energy.

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ELECTRIC POWER

WIND POWER EXPLOITED IN AZERBAIDZHAN

Baku VYSHKA in Russian 16 May 82 p 4

[Article: "Wind, Powerful Wind" (AzINFORM)]

[Text] In all truth, research results over the last few years in the area of wind power energy justify these Pushkin-like lines.

Scientists of the Azerbaydzhani Scientific Research Institute for Energy imeni I.G. Yes'man, having completed an "Index of Winds" in the republic, have determined which places are suitable for the construction of wind power stations [VES]. These powerful stations, the first in our country, will be producing industrial electric energy.

On the basis of a "wind cadaster," a special table for measuring air masses, certain points are established where the mean annual wind rate is equal to no less than nine meters per second. The windiest areas turned out to be the areas of the Apsheronskiy Peninsula in Baku, Sumgait, and the Neftyanyye Kamni. The "wooden windmills" which will grow here are real giants in comparison to their ancient wooden predecessors. Concrete supports will carry huge, up to 80 meters long, arms of the windmill at a height of 50 meters. While turning, they will activate a generator. This type of construction will permit a more effective use of wind energy for feeding industrial and household electric transmission lines.

The proposed output of these VES is two megawatts, which is hundreds of times greater than the output of existing apparatuses.

And although similar stations are only being planned for construction, scientists today are already looking into the future. Scientists at the "Soyuzgidroproyekt" Institute in Moscow have developed a project for a gigantic structure over half a kilometer(!) in height, that is, one and a half times higher than the famous Eiffel Tower.

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ELECTRIC POWER

BRIEFS

PEAT FOUND IN LATVIA--Riga--It took only a few weeks to find peat deposits in an area of 6,000 hectares in Latvia. It was not necessary to probe the soil manually or to drill bores. The exploring party, which would have had to spend around two years on such a project, was replaced by a cross-country vehicle. It was equipped with a special radar, which allowed it to find and classify peat deposits. This apparatus was invented by scientists of the Riga Institute of Civil Aviation Engineers. [Text] [Baku VYSHKA in Russian 11 May 82 p 1] 11350

FIRST SYNTHETIC FUEL FACILITY--Tula--The first synthetic fuel facility in the country, which is being constructed near the "Belkovskiy" mineshaft, will begin producing gasoline out of coal. It is designed to process seven tons of coal in a 24-hour period. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 29 Apr 82 p 1] 11350

SOLAR ENERGY FACILITY--Tynda (Amur Oblast) 7. TASS--The sun heated the workers' dormitory of the "Bamtranstekhmontazh" at the edge of Tynda for the entire winter. Special apparatuses accumulated solar energy and transferred it to a heat supply system, helping it maintain necessary temperatures in buildings even in severe cold. The experiment concluded with the end of the heating season, but according to the experimentors, scientists of the Special Construction Technology Bureau of Glavbamstroy, it confirmed the possibility of using solar energy with the objective of saving traditional sources of fuel. In comparison with the control building, electricity usage here was nearly one-third less. Similar experiments have been conducted in our country and abroad, but this is the first one above the 50th latitude North. [Text] [Moscow PRAVDA in Russian 8 Jun 82 p 6] 11350

FIRST SYNTHETIC FUEL FACILITY--TASS--The first synthetic fuel facility in the country, which is being constructed near the "Belkovskiy" mineshaft (Tula Oblast), will begin producing gasoline out of coal. It is designed to process seven tons of coal in a 24-hour period. Scientists will also test the possibility of obtaining other forms of valuable fuel from the brown coal of the Moscow and Kansk-Achinsk solid fuel deposits. [Text] [Moscow PRAVDA in Russian 29 Apr 82 p 2] 11350

ARMENIAN SOLAR ENERGY FACILITY--TASS--In Armenia the length of time the sun shines is 3,000 hours. Solar radiation reaches 1.6 calories per minute for one square centimeter on the eastern shores of Lake Sevan. Scientists of the republic solar laboratory have invented a number of original devices for using solar energy. /The photograph shows:/ A solar device for accelerated aging of materials is being used successfully by the Yerevan Section of the All-Union Scientific Research Institute for the Cable Industry. It cuts down the time tenfold for experiments with various industrial rubber, paint varnish, and other products. The facility was awarded the Great Gold Medal of the Leipzig Fair. Photograph by G. Bagdasaryan. [Text] [No source and date given] 11350

CSO: 1822/236

FUELS

KEMEROVO PEOPLE'S CONTROL GROUP FINDS MUCH ABANDONED METAL IN COAL MINES

Moscow PRAVDA in Russian 10 Jun 82 p 3

[Article by S. Vinogradov, member of the city's people's control committee and correspondent of the newspaper KUZBASS, and I. Kazantsev, inspector of the oblast's people's control committee (Kemerovo): "Treasure Lies at Mine Faces"]

[Text] The Kuzbass [Kuznetsk Coal Basin] gives the country almost 150 million tons of fuel each year. At the same time, the basin's coal miners consume each year almost half a million tons of rolled steel alone. The modern coal mine, in the direct sense of the word, clings to metal: steel supports, conveyor lines....Let's not go over the whole thing. How is all this used?

The surprise patrol brigades that visited Severokuzbassugol [Northern Kuzbass Coal Production Association] enterprises observed true iron treasure--more than 2,000 units of equipment that cost almost a million rubles had been abandoned underground.

During a check at the Tayezhnaya, Sibirskaya, Biryulinskaya and Fizkulturnik Underground Mines, hundreds of sections of mechanized supports, 48 winches, 108 electric motors, and hundreds of meters of rail and cable were recovered from the heaps. A large portion of this equipment was sent for repeat use and repair.

Such cases of wastefulness were discovered also at other underground mines. At Prokopyevskugol [Prokopyev Coal Production Association] enterprises, more than 3,000 units of equipment were recovered with the help of the patrols. Since the activists' intervention, 141 electric motors, 6 conveyors and 45 tons of metal supports are now being readied for repeat service.

Why did the miners throw away equipment with such a lack of concern? There are many factors here. Let's begin with the plan indicators. Fairly rigid norms have been established for the consumption of wood and electricity, but there is no such strict requirement in the case of metal. Components and parts that have failed and have been replaced by new ones and machines that have served out their time are left underground.

The fact that the quality of mine-equipment repair suffers serious deficiencies in the basin also contributes to this wastefulness. V. Bazhanov, director of one of the repair enterprises--Leninsk-Kuznetsky's Krasnyy Oktyabr--states that, for

example, the winding of the stator of a new electric motor is made with high-quality wire and insulating materials. But second-grade materials are considered permissible when the motor is overhauled. The repeat use of bearings is permitted during the repair of important cutter-loader components, although the specifications categorically prohibit this....As a result, the miners, distrusting the longevity of the repaired equipment, prefer to obtain new machines, and the old ones are relegated to the dumps.

It must be said that the basin's coal workers have many times asked the ministry to create in the Kuzbass a modern base for repairing underground-mine equipment, but they have never received businesslike support--repair is conducted, as before, in repair shops that tend to be of the handicraft type.

But yet the miners themselves are the guilty ones, first and foremost. The results of the surprise visit testified graphically to many omissions in the forming of fixed production capital and in the use of mechanisms. A substantial portion of the equipment is only formally counted in the accounts of the supervisors of sections and services. For example, at the Anzherskaya Underground Mine 156 units of equipment that were lost long ago are listed, several of the accountable persons having been fired from the enterprise, the material valuables being attributed to them.

Formalism in reporting leads also to a freezing of material valuables and the creation of reserves of unused equipment. Here is what the brigade of Rudnichnyy Rayon People's Control Committee of Kemerovo observed at the Yagunovskaya Underground Mine. One of three breakage-front longwall mining machines and two of six tunneling cutter-loaders proved to be in operation, three loading machines and five drilling machines were not being fully used, and 137,000 rubles' worth of outmoded equipment were found in storage. In brief, because of excessive amortization deductions for surplus and unused machines alone, the prime production cost per ton of coal rose by more than 10 kopecks at the Yagunovskaya mine. The people's control committee severely punished mine director A. Frolov and other responsible supervisors. But where is the guarantee that, given existing practice in reporting and responsibility for the use of expensive equipment, the same will not be repeated here or at another enterprise?

Obviously, it is necessary not only to strengthen monitoring and responsibility but also to use material incentives in full measures to save metal, spare parts and other materials, as the Nagornaya Underground Mine of Gidrougol [Hydraulic Coal Mining Association], for example, has been doing for a long time. The party committee, economic supervisors, and the lead group of people's control were able to concentrate the attention of the whole collective here on savings and thriftiness and they ensured an effective demand and realistic prerequisites for preserving the people's property. The system of mutual monitoring produces great benefit. Its principle is simple and reliable: the tunnelers, on receiving conveyors, rails for laying track, and other equipment, are obligated, after completing the preparatory work, to transfer them to the breakage-front workers for operation. And the latter unfailingly check that everything necessary for normal operation is in place.

Several years ago a new form of accountability for turning unused metal supports and materials over to storage was introduced at the mine. In brief, each middle-level supervisor knows which and how much materials he should return to storage

upon elimination of a worked-out longwall, and what and how much he will receive, let's say, from the breakage-front workers for repeat use, during assembly. If you did not stay within the task you blame yourself: you, along with the mine foremen, are deprived of a bonus.

And there is still one important "trifle." Mobile container-receptacles have been brought to each section, into which clamps and nuts, tie plates and bolts, and spare parts that have been picked up off the ground can be dropped. Each month the receptacles are sent to the surface and the property saved is carefully counted. Thirty percent of the cost of the materials, spare parts and other parts saved is paid to the brigade as an award for thriftiness.

The workers of the industrial Kuzbass came out at one time with initiatives for the effective and economical use of fuel and power resources, and they achieved many successes. Metallurgists of Zapsib [West Siberian Metallurgical Plant imeni 50-letiya Oktyabrya] and the Kuznetsk Combine imeni V. I. Lenin have long been famous as masters of rolling metal at negative tolerances and in the effective use of metal during all metal-conversion processes. The basin's miners have someone to be on a par with, someone to take an example from, so that the words about an economical economy will be translated into life.

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FUELS

NEW PROCESS COULD PREVENT COAL LOSSES DURING TRANSPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jun 82 p 2

[Article by V. Kladchikhin: "Veil Over the Coal Car. Strict Accounting for Fuel and Energy"]

[Text] From the editors: The problem of the need for protecting coal from being blown away during hauling by railroad has been brought up many times in the pages of SOTSIALISTICHESKAYA INDUSTRIYA. But experience has shown that solution of the problem is being slowed down by bureaucratic squabbles and lack of coordination between allies. In publishing this article the editors hope that interested parties will finally find a common language and put a reliable damper on the path of massive fuel losses.

[Text] Who has not seen coal trains enveloped in a black shroud? Up to 50 million rubles are spent every year by railroads to clean coal dust from the roadbeds.

And at the same time, there is a fairly effective means of dispensing with the problem. In operation at the Abashevskiy concentration mill in Kuzbass is a facility for applying a water-mazut emulsion to the surface of the fuel in the car.

"It was put into industrial operation seven years ago" we are told by mill director V. Yurmazov. It was learned in tests that not only mazut, but depleted oils and other petrochemical wastes can be used. To this day they speak well at the mill of Doctor of Technical Sciences V. Ivanov, Candidate of Sciences I. Radovitskiy and other workers of the Institute of Fossil Fuels who were instrumental in installing adjusting and starting the equipment.

The outlays of 160,000 rubles were paid back within a year of operation, and now the yearly savings exceeds 220,000 rubles. Over the past five years about 80,000 tons of costly coal concentrate has been saved from blowing away.

The Abashevskiy experience has been demonstrated at the Exhibition of Achievements of the National Economy of the USSR. Central television has brought the news to the Soviet general public. The newsreels have made a documentary

film. Numerous prospectuses have been published. In short, there is no cause for complaint about lack of coverage. Nevertheless, the coal dust lies over the Kuzbass railroads as before, and elsewhere as well. Why?

Let us put this question to those who by logic should adopt leading experience, since they are close at hand.

"It was suggested that a facility of this kind be built at one of our mines" recalls V. Cheremov, technical director of "Prokop'yevskugol". Now I have even forgot which one it was. Reasons? There aren't any save that we just don't have time to handle all construction."

V. Utkin, chief of the transportation administration of "Gidrougol", as if continuing this thought, tells us: "We would have to build our own depot first. Depot, inspection channels, we don't lack for priority projects. Until we take care of them, there is no point in talking about the shielding unit."

Things are exactly the same with other neighbors. Every day Kuzbass sends out 6,500 cars of coal. About a ton and a half of fuel flies out of every one of them. In other words, some one of the most productive mines in the basin operates literally into the wind. There are data on an even greater scale. Nationwide, from 3 to 5 million metric tons of coal are blown out of transport each year! This is the annual supply of raw material for a large electric power facility!

Nevertheless, until last year you could count the number of shielding units nationwide on the fingers of one hand. And at the same time, the Abashevskiy experiment has received official recognition. On 11 May last year, a decree was issued by the USSR Ministry of the Coal Industry stating that 35 such devices are to be built in the sector during the current five-year plan. The responsible parties are the chief of the administration on long-range development of the coal industry and capital investments F. Kagan, and the chief of "Soyuzshakhstroy" Association, Ye. Strel'tsov.

I asked F. Kagan to acquaint me with the current state of affairs.

"Could you call back in an hour or so? I don't have the data right at hand."

An hour later, I was talking with his deputy, V. Filiponskiy.

"Recently shielding units have been put into operation on the Chervonograd and the Sholokhovskiy mills and are to be introduced at the Komsomol'sk and Dolzhanskiy-Kapital' mills. As you can see, we've covered Donbass, Rostov and Western Ukraine."

"But Kuzbass? It's from Kuzbass, not Donbass, that coal travels over the greatest distances."

"In Kuzbass there are not enough construction workers, and besides there is a shortage of housing and cultural amenities. We have to give those construction projects priority."

It would be hard to dispute such a weighty argument. Indeed the construction of housing and day nurseries is not keeping up with the demand. But not a single team could be found on these construction projects that had been taken away from building a dust-laying facility. Nor for that matter on the very sites designated by the decree.

According to the decree, a facility is to be started this year at Kiselevsk concentration mill. However, "Prokop'yevskuglestroy" Trust has yet to drive the first peg on the project. Also in this year, coal cars are to be sprayed at the Belovskiy and Anzhersk mills. But there is no hint of construction there either.

In short, the USSR Ministry of the Coal Industry is not utilizing the centralized method of construction during this five-year plan to build a single facility in Kuzbass. The decree, so late in coming, is not being met...

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FUELS

PERMANENT APPROACH TRACK NEEDED AT BORODINO MINE

Moscow EKONOMICHESKAYA GAZETA in Russian No 34 Aug 82 p 18

[Article by B. Pichugin, chief of the coal industry sector of the Party Kray Committee: "The Difficult Roads of KATEK"]

[Text] Somehow nowadays when anyone talks about the Kansk-Achinsk Fuel and Energy Complex [KATEK], most people think about the facilities in the southern (Sharypovo) industrial unit. But KATEK also subsumes the Borodino and Nazarovo pits. The coal deposit is being worked here for the first time. Now both these pits are providing about 100,000 metric tons of coal per year.

The technical-economic indices that have been achieved in open-pit coal mining are much higher than the sector-wide average. This has been one of the weighty arguments in favor of accelerated development of the Kansk-Achinsk coal basin.

The circle of customers for Borodino coal is widening. Therefore completion of reconstruction on the existing pit is a priority job for miners and construction-millwright organizations relocated in the young city of Borodino. The goal is to introduce facilities for extracting 2.5 million tons of coal in 1982 with as much of an increase in 1983.

Right now there is an urgent need for planning estimates. Funding has been assured for the planned volumes of construction and installation work. The construction of production facilities has been commissioned to the Borodino Mine Construction Administration of "Krasnoyarskugol'" Association. The installation of large excavators, which will be used in stripping work and in extraction of fuel is being handled by "Sibtekhmontazh" Trust. The collective of Construction Administration No 604 is erecting housing and public amenities. And the second electrified approach track from the Trans-Siberian Railroad to the mine is being built by "Krasnoyarsktransstroy" Trust (managed by V. Yakushin).

During the first six months, the work of transport builders had been extremely unsatisfactory. And it did not improve in July. This is a threat to completion of the assignment on the development of the mine as a whole.

It was stipulated in the Borodino mine reconstruction project that until its yearly capacity had reached 16 million metric tons, coal would be hauled out on a single approach track. Then it was planned to put a second electrified

track into operation, expand a number of stations and turn the whole branch line up to Ugol'naya II station over to Krasnoyarsk Railroad. Such a transfer has no formal significance, it is economically justified since it will cut nearly an hour off the turnaround time of cars and will enable more precise organization of coal haulage.

Even now, 20 million metric tons of fuel are being extracted per year. It is very difficult to haul it out. It cannot be managed without putting the second track into permanent operation in the near future. Do the directors of "Krasnoyarsktransstroy" know about this? They do, but they do not have the proper attitude of responsibility toward expeditious completion of the job of laying the track. This is not the first year that work has been lagging. In the last six months, less than a third of the yearly work volume has been done.

The customer -- "Krasnoyarskugol'" Association -- has proposed that "Krasnoyarsktransstroy" include construction and installation work costing 4.1 million rubles in next year's plan for the second track. The trust has agreed to take on 2.1 million rubles, which is half the amount assigned for the current year.

Within two years, the total extraction of coal is to be increased by five million metric tons. Hauling it out of the mine may become a bottleneck. We will have to pay dearly for introducing facilities for "truncated" startup complexes, for completing projects after they have been put into operation.

We needn't go far for examples. In February 1982, papers were signed on putting a temporary approach track into operation to the industrial yards of Berezhovka mine No 1 with a sworn promise to get it into permanent operation in the first half-year. The approach track is now carrying about a hundred coal cars a day, as well as bringing in materials for mine construction. The trains travel at a speed of 5-10 km/h -- the state of the track does not permit faster travel.

No steps are being taken to eliminate the inadequacies. Now the directors of "Krasnoyarsktransstroy" say that perhaps they will complete work on the track in the next month or two, on condition that coal haulage is completely stopped. And the promises made at the beginning of the year have been tossed aside.

We must not permit a repetition of this story. Interruptions in haulage of coal from the Borodino mine may complicate the supply of fuel to consumers in Krasnoyarsk and in the eastern rayons of the kray, as well as in Irkutsk Oblast. The miners and workers in the loading and transport administration are unanimous in their opinion -- no temporary solutions or compromises, just put the approach track into permanent operation! Borodino Gorkom of the Party is of the same view. Its workers are constantly on the construction site.

Right now less than two-hundred people are employed on the project, but at the beginning of the year the plan called for three-hundred workers to finish the job. However, now since the lag has increased we need at least twice

as many workers and considerable improvement of labor organization so as to have the work done in a favorable period.

The situation that has arisen requires the intervention of Deputy Minister of Transport Construction T. Gogichashvili. We call upon the Ministry to see to reinforcing the material and technical base of the trust.

Subdivisions of "Krasnoyarsktransstroy" Trust are now experiencing a shortage of materials, especially crossties. At the same time, a large number of ties are waiting for shipment from Lesosibirsk Station and some others. And the Ministry of Railroads has reconciled itself to this situation. The delay in construction of approach tracks and development of station management in the vicinity of enterprises of the Kansk-Achinsk Fuel and Energy Complex must be overcome in a short time. There are real capabilities for doing this.

This is the conclusion that has been reached by the coordination council on setting up KATEK affiliated with the Kray Committee of the Party. At a session in Sharypovo recently, this committee looked into the progress of work and shortcomings of both clients and subcontractors, indicating steps to eliminate dereliction.

Timely introduction of facilities in mines and at Berezovskaya GRES-1 will depend in large measure on the efficacy of solutions for the problems of finishing approach tracks.

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FUELS

INCREASING ASH CONTENT OF L'VOV-VOLYNSKIY COAL NOT TREATED PROPERLY

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 May 82 p 2

[Article by L. Sotnik (Chervonograd): "Down to the Last Gram"]

[Text] They had been waiting for it with impatience and hope. At Ukrzapadugol [Western Ukraine Coal Production Association] underground mines they were saying of it: "It will help us greatly. In any case, the coal-quality problem will be solved once and for all."

"It" was the central enrichment plant, known more briefly as the TsOF, which was being built in the Lvov-Volynskiy Coal Basin.

But somehow we do not see joy on the faces of those who had awaited startup of the plant as if it were manna from heaven. V. Grigor'yev, director of Velikomostovskaya Underground Mine No 5, for example, does not conceal his negative attitude toward the new industrial giant: "It fell on our heads out of nowhere!" Association general director A. Kizub does not express such seditious thoughts but discretely omits the TsOF from the conversation.

And here is what happened: since startup of the plant, the number of underground mines in the basin that did not carry out the coal-mining plan has increased, and the supplying of fuel to the basin's two chief customers--the Burshtynskaya and Dobrotvorskaya GRES's--has deteriorated.

But what does the TsOF here have to do with it, I asked. In what way can the plant affect the mining? It has its own job--to separate coal from dead rock.

It turns out that it can. Let us imagine a situation: a trainload of coal from a mine that we know about arrives on the TsOF's siding tracks. The weight of the mined material shown in the accompanying papers is 1,000 tons. But after appropriate laboratory tests it turns out that the material's ash content is higher than that specified for the given mine by the plan indicator, and then....And then V. Grigor'yev learns that he has sent it not a trainload but two-thirds of a trainload and that his mine's plan for mining coal has not been overfulfilled, as had seemed earlier, but has been underfulfilled, with all the consequences that ensue from this.

Well, and what is bad about that, the reader thinks. On the contrary, it is good that the TsOF has begun to play the role of a barrier in the path of low-grade output. Let the miners refrain from exceeding the established norm for the ash

content, let them mine high-quality coal, and then no one will dare to take from the amount mined even a kilogram, much less a ton.

This would be logical. But there are essential flaws in it that will be easier to understand if one gets down into the depths of the coal mines and of economics.

The Lvov-Volynskiy Coal Basin is 30 years old. Formerly, when breakage-face work was being done at seams a meter or more in thickness, coal quality problems such as this were practically nonexistent. But years have passed. The coal reserves of meter-thick seams have increasingly been depleted, and the miners have been compelled to undertake the development of thinner seams, 50-70 centimeters thick. The taking of wall rock--a purely episodic phenomenon in former times--became inevitable. Moreover, and we are not afraid of these words, it became a part of the technology. It is clear that under these circumstances coal quality began to be reduced, and the ash content rose. During the last 10 years it rose almost a tenth for the association, and in 1981 it averaged 30.3 percent. At some underground coal mines this level is even higher--up to half of the mined material.

These realities were well known both to Ukrzapidugol and UkSSR Minugleprom [Ministry of Coal Industry]. If one closes one's eyes to them, as is being done right now, it is scarcely possible to raise the fuel's calorie content. You will get something else: the teeth on the pinion gear of the mechanism that connects the miners with customers for the fuel will begin to crumble. And once that happens, the work of that tooth and of the others will begin to get worse.

And we are reminded, in this connection, of the recent meeting of mining brigade leaders that was convened at the initiative of the Chervonograd city party committee. Labor expenditures are growing, it was noted at this conference. Well, yes, the brigade leaders said, we also want the coal to have more calories, but you will not live by our dreams--the brigades have begun to thin out, the miners are leaving for other enterprises....

The association's economics service confirmed for us the fact that labor expenditures had grown. During the last decade they rose by 15.3 percent. During that same time the prime production cost of a ton of coal increased 2.01 rubles and instead of a balance-sheet profit of 12,562,000 rubles (1971), 56,871,000 rubles were lost in 1981.

And these also are realities.

What did the city committee's conference show? The fact that the normal moral and psychological climate that had been maintained for a long time by the basin's huge miners' collective began to change somewhat. The brigade leader began to look askance at the mine director, he at the TsOF manager, the latter at the "general," and he at the association director, to whom it sometimes seemed that the plant was overstating the ash content deliberately....And everyone looks for the guilty parties. The association general director poses to the ministry the problem that some mines will have to raise the ash-content norm, that they will do it in accordance with existing mine-geology conditions, and they hint at him: you are looking for an easy life?

The existing situation must be looked at as one instance of the unsuitable "ostrich wing" tactic. One "lowers" the plan, knowing ahead of time that it will not be

attainable, and the other accepts it, knowing that it will not have to be reported....And then begins the tedium of getting revisions and a rescue of "the collective's interests...."

But even this is no argument, says the wised-up economics worker. Give these miners free rein and, just like that, they will, generally speaking, load empty filler instead of coal. To the miners, the only thing is the tons.... Well, several years ago even the author of these lines would have been in the ranks of the skeptics. It's entirely accurate: mining was measured in tons, and few worried about the quality of the tons themselves. But now an integrated system for controlling coal quality (KSUKU) has been worked out in the Lvov-Volynskiy Coal Basin and its introduction has started, and the Red Banner collective of Velikostovskaya Underground Mine No 3 came out as the initiator of this good thing. We shall not tire the reader with a description of the system and figures that testify to its effectiveness (see V. Chernenkov's article, "Standart prikhodit v zaboy" [The Standard Comes to the Mine Face], in SOTSIALISTICHESKAYA INDUSTRIYA for 10 March 1981), and we will say but one thing: the system serves as an excellent counterweight to those who have been engrossed with the gross. A staircase of incentives was put together for it in such a way that each breakage-face worker and each brigade leader should strive (and strive!) to do everything possible to see to it that the inclusion of wall rock is minimal or is entirely excluded, so that the mined material sent to the surface will be comprised of as much coal as possible and as little dead rock as possible! Under the system's principles, the miner is rewarded not only for the quantity but also for the quality of the coal that is mined!

And it is very much a pity that in the hubbub of day-to-day affairs, in the pursuit of tons, the existence of the KSUKU and the necessity for introducing it into the basin was silently forgotten....

If one sums up the results of everything that has been said, then the following conclusion can be reached. The ash content of the seams cannot be reduced, either now or in the future, but it is possible and necessary to drive for coal quality. The specialists consider that for this purpose three tasks must be resolved: to adjust the plan of the underground miners' collectives to take into account the actual and increasing ash content and to consummate introduction of the integrated system for controlling coal quality at all the basin's mining enterprises, and to speed up the output of special machinery for thin seams. We do not say that these tasks will be easy, but USSR Minugleprom and Ukrzapadugol should undertake to resolve these problems more energetically. Life itself dictates this.

And so we have become convinced that the TsOF is not at all guilty of the difficulties that have existed in the basin. It has tried to the utmost to provide the customers, first and foremost the power-engineering workers, with high-calorie coal. But neither have the power engineers been too contented. Let us name this situation paradox No 2, and we shall try to look into it.

The fact is that coal for electric-power station fireboxes (even that of poor quality!) has simply become physically insufficient. A portion of the mined material, in passing along the preparation plant's operating chain, is, roughly speaking, subdivided into three fractions--coal for household needs, steam coal, and rock which goes to the dump. When it is considered that rock makes up almost half of the mined material, then it is not difficult to guess the fraction to which the

actual weight of the fuel that is being sent to electric-power stations has been reduced.

It seems at first glance that there is no harm of any kind in this. But the whole point of it is that the dead rock is not so dead, for it contains 25 percent of fuel substance. Nowadays, million-ton dumps of rocks are being built up alongside the Chervonograd TsOF that are not being used at all, yet, for example, the Bursh-tynskaya GRES imports from the Donbass [Donets Coal Basin] each year up to 20 percent of the fuel consumed. In 1980 alone, the station had to overexpend 4,082,200 rubles under the category of "transport expenditures."

So what is to be done? Close the TsOF, bewail the millions spent on its construction, and return to the good old times, when coal was dispatched to power stations directly from the mines' tracks? No, and there's no sense in simply dumping seemingly dead rock. According to studies of specialists from Yuzhtekhenenergo [not further identified] and the Institute for the Geology and Geochemistry of Fuel Minerals of the UkSSR Academy of Sciences, it can, when spiked with coal, serve fully as a fuel for electric-power stations, and, while this fuel will contain 50-percent ash, its calorie content will scarcely be less than that of Estonian shale.

Why won't this be enough?

The know-how to burn this type of mined material requires scientific development and broad experiments. Studies are needed of new design solutions that would compel low-calorie fuel to "work" at electric-power stations. And the close collaboration of the Union's Minenergo [Ministry of Power and Electrification] and Minugleprom and of scientific institutions is needed in solving all these questions.

And a last question: is the game worth the candle? It is certain that it will be. It is not economical to send coal to western areas of the Ukraine from the Donbass, which, because of its own insufficiency of fuel, is converting some of its thermal power stations to mazut. Local resources must be used. As a whole and completely. It is then that the economy will be economical.

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CSO: 1822/242

FUELS

TRANSBAYKAL COAL MINES NEED MORE WORKERS

Moscow PRAVDA in Russian 15 Jun 82 p 3

[Article by V. Gorlov, chief of the Buryat ASSR Vocational and Technical Education Administration (Ulan-Ude): "Who Must Develop the Treasuries"]

[Text] I recently visited the Gusinoozerskaya Underground Mine. It and the neighboring Kholboldzhinskiy Strip Mine provide coal to the high-capacity Gusinoozerskaya GRES. A second phase of the power station is to be built. When it goes into operation the GRES's daily coal requirement will exceed 10,000 tons. Will this be within the capabilities of the local miners?

"We have vast fuel reserves, but there are not enough work hands," said underground mine director S. Tumurov with concern.

Such anxious words were heard also from the managers of a number of other mine enterprises of the Buryat ASSR and Chita Oblast.

The Transbaykal mining industry is actually being developed rapidly. In the not so distant future the miners will have still more business. The Baykal-Amur Mainline will enable a number of most valuable mineral deposits that are of nationwide significance to be placed at the country's service.

And there is so much coal in the Transbaykal! Its industrial reserves comprise billions of tons. The coal miners of the Kharanorskiy Strip Mine are to increase the mining of fuel substantially--by the end of the five-year plan they should supply energy to the like-named GRES, which is under construction. The new, large Tugnuyskoye field should be readied for development. Its annual capacity will be more than 10 million tons of coal. And there are many other places where it is necessary to apply the miners' skill, ability and persistence. In brief, the problem of reinforcing mining enterprises will become paramount.

How is this to be solved today? Studies by local sociologists do not produce a basis for optimism. More than 60 percent of all workers here are people 35 to 60 years old. When it is considered that a substantial portion of the miners go on pension at 50 years, then the state of personnel affairs cannot be called satisfactory at all. Very few young people work at Transbaykal mining enterprises. There are several reasons for this.

For example, in recent years the average monthly wage of workers of the most important Buryatia mining enterprises rose more slowly than they did for the country

as a whole. Living conditions in our districts are severe, and the area is sparsely populated. And we are still building little housing for people here. There are not enough kindergartens, nurseries, schools, clubs and stores.

Mining industry managers and local party and soviet organizations are making attempts to solve the personnel problem. Thus in January the USSR Ministry of Coal Industry and Ministry of Education, in a joint letter, defined a plan for sending graduates of the 8th to 10th grades to vocational and technical schools. Deputy Minister of Nonferrous Metallurgy Yu. Andrianov in turn called the attention of enterprise supervisors to the inadequate work done at vocational and technical schools with pupils for Mintsvetmet [Ministry of Nonferrous Metallurgy]. Their letters were profound and well thought out, but the instructions contained therein, unfortunately, were not carried out.

There are in our region no vocational and technical schools for the coal industry at all, and for nonferrous metallurgy there is only a small vocational and technical school, which trains 30-40 people per year. At the same time, throughout the Buryat Vocational and Technical Education Administration alone, the output for other industries annually comprises more than 10,000 workers of almost 100 trades. According to the 26th CPSU Congress directives, the Ozerneyy Combine will be built soon in the Transbaykal. Mintsvetmet has planned to have a PTU [vocational and technical school] under it. However, the realization even of this decision is being held back unjustifiably.

In brief, the situation has been so complicated that measures must be taken without delay to form labor collectives of mining enterprises with young workers of various trades. The first word here should be said by the Buryat ASSR Council of Ministers and the union branch ministries. Buryat ASSR Gosplan should, taking plan indicators into account, develop as rapidly as possible a unified personnel policy for mining enterprises, and balance it with the labor resources that are available within the autonomous republic, taking population migration into account.

Special attention must be paid to developing vocational and technical schools. Qualified workers can be trained only in them.

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FUELS

GREATER INDUSTRIAL USE OF BITUMENS URGED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 May 82 p 2

[Article by A. Zeninskiy, manager of the Economics Laboratory of the All-Union Scientific-Research Institute for Hydrocarbon Raw Materials (Kazan): "Just Until the Tests"]

[Text] What prevents the industrial use of natural bitumen reserves.

There are substantial reserves of bituminous rock--sands, sandstones and limestones saturated with organic substances--in some parts of our country. The viscous crude oil removed from them can be a raw material for obtaining motor and boilerhouse fuel, asphalt, lubricating oils, coke and sulfur. Natural bitumens can also be used in the "natural" form--without any processing--for the construction of roads.

Natural bitumens began to be used for road topping in the USSR back in the middle of the 1960's. For example, a highway built with the use of bituminous rock under the difficult climatic conditions of Guryev Oblast is in a completely satisfactory condition after almost 20 years. However, the matter has not progressed beyond individual experiments.

Meanwhile, the shortage of bitumens, which are now obtained from crude oil, is one of the main causes of the low density of roads and, as a consequence, of the excessively great consumption of fuel for automotive hauling. Calculations indicate that a 1-ruble shortage of petroleum bitumens for road topping leads to unjustifiable expenditures of 1½ rubles in the national economy.

A number of decrees of the USSR State Committee for Science and Technology have been adopted about the problems of the industrial use of bituminous rocks. At the same time, many fundamental scientific and technical questions still have not been completely resolved.

Some of the main causes of this situation are a bureaucratic approach to the solution of this serious task and the absence of specific financing and incentives for the work. Few groups in institutes of the USSR Ministry of Geology, Ministry of Petroleum Industry, Ministry of Transport Construction, and other branches are occupied with questions connected with the use of natural bitumens. Research often is conducted by way of personal initiative. Such a lack of coordination does not favor the business.

Obviously, a radical change can be achieved if the conquest of bituminous rock is properly organized. It is completely obvious that more precise coordination of the conduct of a large number of research and industrial-experiment operations on natural bitumens is necessary, in order to organize the use thereof on an industrial scale in the next few years.

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FUELS

NERYUNGRI MINERS PLAGUED BY DUMPTRUCK PROBLEMS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Aug 82 p 2

[Article by P. Rozentul', chief of the motor transport administration of "Yakutugol'" Association: "Why the 'BelAZ' is Standing Idle"]

[Text] Neryungri, Yakut ASSR--In the article "The Wherewithal for Taking Yakut Coal" (SOTSIALISTICHESKAYA INDUSTRIYA 7 Jul 82) we were told by V. Zhdamirov, general director of "Yakutugol'" Association, that the excavator is the primary means for stripping work. Boldly stated, but I think not quite exact. Stripping involves bulldozers, excavators and technological motor transport, and they are all "primary."

I want to stress the last link of this chain, a link no stronger, and perhaps weaker than the excavator link. Why? Because the "EKG-20" excavator that will determine the inventory of machines of this type working on stripping in the near future is already in existence and in operation. Intensive work is being done on perfecting it and eliminating design flaws. As to the "BelAZ-7521" dumptruck with load capacity of 180 metric tons (I remind you that last year 33 such machines were to be in operation at the "Neryungrinskiy" pit), we have not yet seen even an experimental model.

In order to get down to the coking coal of Southern Yakutia in the next two years we will have to haul away about 350 million cubic meters of rock! Right now this gigantic load is on the 180-ton "M-200" dumptrucks that we have in the association.

With proper use and maintenance, the "M-200" truck is quite capable of hauling a million cubic meters of rock a year, as demonstrated by the example of the Mezhdurechensk truck base in Kuzbass. Our best crews have an annual output of about 600,000 cubic meters. However, our average is 326,000 cubic meters, i. e. only about a third of what is possible!

What is the reason for this? Briefly, the level of technical servicing of the "M-200" dumptruck does not correspond to its level of complexity. The vehicle is literally crammed with up-to-date automatic, electronic and hydraulic systems. The driver needs a secondary education as a minimum, and only an engineer can handle troubleshooting, direction of technical servicing and repair.

This work requires well-equipped, warm, well-appointed enclosures, so-called technical posts. According to calculations, we need 22 such facilities. We have only two inadequate unheated temporary sheds!

The responsible party for ensuring conditions for adequate use of the "M-200" dumptrucks is to be the technological motor transport base under construction in Neryungri and to be equipped with the last word in technical facilities. The estimated cost of the base is 78 million rubles. It was supposed to have been operational in 1979. However, even now, three years late, there is no assurance of imminent completion of this important project.

What has stretched construction out for so long? The main cause is the worthless job organization. "Promstroy" Trust (chief B. Borisov) of "Yakutuglestroy" Combine is systematically failing to complete the plan. The construction site has no working force. It looks like the miner clients have reconciled themselves to such a situation even though the truck base is project number one. Without "wheels for the stripping" there will be no stripping and no coke.

Now I would like to turn my attention to the equipment of the Belorussian Association for Production of Heavy Trucks, since I am still hoping that we will be seeing it in the near future. Preparations for this must be made beforehand. We know this from experience in using the "BelAZ-7420" 120-ton dumptrucks for hauling coal.

It is my opinion that the reason for the frequent down time and breakage of trucks is not the rough terrain as surmised by V. Zhdamirov, but rather a number of design failures. In all conscience, it must be said that the truck needs considerable improvement. The list of modifications was defined five years ago. Nonetheless, the specialists at the truck plant have not made a single fundamental improvement in design in all that time.

The Belorussian Association has a base in Neryungri. We have even allocated living space for the workers in this base, although it was a complicated job under conditions of acute shortage of living quarters! But in essence we have seen no help from the plant representatives. They have been concentrating attention on determining the errors of operators and gathering facts to bolster their own case rather than improving the vehicles. Another aspect of our activity is calling in repair teams from Minsk. Such a team will arrive, eliminate some local defect, and hardly leave when another is found and so on ad infinitum.

And this is why the time has come to improve the arrangement of interaction between the Neryungri miners and the Belorussian truck builders. Neryungri needs a "BelAZ" service group of skilled technicians who could resolve technical problems on the spot and take specific steps to eliminate flaws in the trucks. They should have at their disposal a renewable stock of guaranteed spare parts and other material means.

Of course, I realize that the Neryungri coal pit is a unique proving ground under experimental conditions. But this is no justification for a situation where, figuratively speaking, we do not ride on the trucks, but rather the trucks ride on us. The severe conditions of the North require unification of the efforts of all those who are responsible for timely delivery of Yakut coke to the national economy.

FUELS

BRIEFS

RIVER TRANSPORT INCREASES--Perm'--Despite low water in the Kama this summer, collectives of "Permlesprom" All-Union Association are successfully rafting commercial timber. Raftsmen from the most remote waterways, Ust'-Yaz'vinskiy and Ryabininskiy, have in large measure determined the schedule. More and more freight previously handled by railroads is being sent by water. To handle the traffic, the Kama River Navigation Company is reconstructing existing wharves and building new ones. For example construction has started near the port of Kambarka on a large coal transshipment complex. Portal cranes are being replaced here with high-speed car dumpers. [V. Biryukov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 16 Aug 82 p 2] 6610

MINERS SURPASS QUOTA--Pervomaysk, Voroshilovgrad Oblast--The other day the miners of N. P. Letoshko's team fulfilled the nine-month plan at the mine imeni Menzhinskiy of "Pervomayskugol'" Production Association. Since the beginning of the year they have hoisted about 160,000 metric tons of fuel. The members of the team have pledged consignment of 60,000 metric tons of coal above the quota to consumers by the sixtieth anniversary of the USSR. By making able use of a narrow-grab facility with individual shoring, the miners are exceeding the plan each day by 130 metric tons or more. [V. Mikhaylichenko] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 82 p 1] Yuzhno-Sakhalinsk--Sakhalin miners are increasing the consignment of coal to consumers. Crews of excavator operators from the "Novikovskiy" pit, headed by machine operators M. R. Shlendik and M. P. Shalayev are working in close contact with the truck drivers. The "workers' relay race" has helped in winning first place in the competition of "Sakhalinugol'" Association, saved 80 metric tons of diesel fuel, and 126 kilowatt-hours of electric energy. The miners of "Lermontovskoye" administration of Uglegorskaya mine have sent off nearly two million rubles of goods above the plan. [N. Artapukh] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Dec 82 p 1] 6610

CONSTRUCTION STATUS IN SHARYPOVO--Krasnoyarsk Kray--One of the youngest cities in Krasnoyarsk Kray, Sharypovo, is only one year old. The citizens proudly call their city the capital of KATEK, the enormous construction project of the Kansk-Achinsk Fuel and Energy Complex. However, its youth has not kept the city from celebrating its first birthday with glorious gifts of labor and with great triumphs in industrial and sociocultural construction. More than 50,000 square meters of living space has been made available, including the first nine-story apartment building with up-to-date accommodations. It is

already occupied. A shop, 300-place dining hall, drugstore, café and youth center with 500-seat auditorium have been built. Nearly 300 children attend the new kindergarten. By the first of September, two new schools for 2,000 students will open their doors. A hospital and mechanized bakery are being constructed. A new airport is about ready to open. [A. Shcherbakov] [Text] [Moscow IZVESTIYA in Russian 10 Aug 82 p 2] 6610

MINERS AHEAD OF SCHEDULE--Perm' Oblast'--The miners of Kizelugol' Association are ahead of schedule in meeting their socialist obligations in honor of the sixtieth anniversary of the Soviet Union. They have resolved to bring the score of above-plan fuel to 100,000 metric tons by the end of the year. The leaders in labor competition are the collectives of the "Zapadnaya", imeni Krupskaya, "Kospashskaya" and "Gremyachinskaya" mines. Here they are ahead of schedule on preparatory work and are making the best use of equipment. The collective directed by Communist V. Moor has distinguished itself among sections from the "Kospashskaya" mine. [V. Ukolov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 18 Aug 82 p 1] Krasnodon--A new labor victory in competition has been won by miners of the team led by Hero of Socialist Labor A. Kolesnikov, delegate to the Twenty-Fourth CPSU Congress from "Molodogvardeyskaya" mine of "Krasnodonugol'" Production Association. They have completed their eight-month quota ahead of schedule and have already been working for several days on the September quota. Since the beginning of the year, 400,000 metric tons of fuel have been hoisted, of which 100,000 are in addition to the assignment. [V. Mikhaylichenko] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 1 Aug 82 p 1] 6610

MECHANIZATION BOOSTS OUTPUT--Krasnoarmeysk--Miners of "Krasnoarmeyskugol'" Association report fulfillment of the six-month coal extraction program. Since the beginning of the year, 335,000 metric tons of fuel above the plan has been sent to consumers. The production cost of each ton has been reduced by 21 copecks. This success has been due to high organization of labor and mechanization of production processes. Currently in the association 95% of the fuel is extracted by mechanized facilities. And the mean daily load on the "iron" longwalls is more than 820 metric tons -- 4.6% higher than the established quota. There are no lagging enterprises in the association. The championship in socialist competition in honor of the sixtieth anniversary of the USSR is held by collectives of the "Tsentral'naya", imeni Stakhanov and "Kranolimanskaya" mines. [G. Dorofeyev] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jun 82 p 1] 6610

NEW MINE CAR PROPOSED--"The time has come to retire conventional mine cars" is the opinion of specialists at Karaganda's "Giprouglegormash". They have backed up this viewpoint by producing a rubber-tired self-propelled car. It consists of a four-wheeled chassis with all wheels driven and controllable, and a dump conveyer with height that can be adjusted. The wheels on each side are turned by an individual induction motor with high-percentage slip. Three car speeds are provided by switching these motors. Minimum turning radius is 7.5 meters, which enables the car to fit into all existing mine junctions, and a two-position cab is provided for "shuttle" driving without turning. [A. Sokolov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Jun 82 p 2] 6610

HALF-MEGATON COAL OUTPUT--Krasnodon, Voroshilovgrad Oblast--A great labor victory has been won by the miners of a team led by Hero of Socialist Labor A. Kolesnikov from "Molodogvardeyskaya" mine. They have hoisted their five-hundred thousandth metric ton of coking coal since the beginning of the year. This high mark has been attained a month and a half ahead of schedule. The miners are getting ready for a worthy celebration of their professional holiday, Miners' Day. Every day they produce 400 or more metric tons of coal above their quota. The monthly work output of a worker at the cutting face has been brought up to 547 metric tons with a quota of 450 metric tons. Among those making the greatest contribution to attainment of collective success are experienced foremen V. Temnikov, V. Aristarkhov and V. Golotovskiy. [V. Mikhaylichenko] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 19 Aug 82 p 1] 6610

NERYUNGRI PASSES FIFTH MEGATON--The five-millionth metric ton of Neryungri coal has been transshipped by the collective of the Ugol'naya-Berkakit-Tynda Railroad Line since it started operation. [Text] [Moscow EKONOMICHEKAYA GAZETA in Russian No 29, Jul 82 p 3] 6610

COAL OUTPUT SURPASSES PLAN--Voroshilovgrad Oblast--More than 900 metric tons of coal a day at a quota of 750 metric tons is the output produced by a team led by Hero of Socialist Labor Ye. P. Zav'yalov from Stakhanov's imeni Il'ich mine. This young Komsomol collective works on a narrow-gauge combine and gets the best results in the mine. Every member of the team is a jack of all trades who can do nearly all the production operations on the section. The leading team is sharing their experience with the miners of the other shafts of "Stakhanugol'" Association. [D. Chaban] [Text] [Kiev PRAVDA UKRAINY in Russian 9 Jul 82 p 1] Tula--"Plus a Quarter of a Million Tons". Such is the enormous boost over the plan provided by miners of "Novomoskovskugol'" Association in meeting their annual socialist obligations for extraction of fuel above the quota ahead of schedule. Leaders in the competition for worthy celebration of our nation's birthday are collectives of the "Progress", "Sokol'nicheskaya", "Dubovskaya", "Gorniyak" and "L'vovskaya" mines. [I. Aryasov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Aug 82 p 1] 6610

MINERS AHEAD OF SCHEDULE--Rostov-na-Donu--In early August the miners of Gukovo's shaft imeni the Fiftieth Anniversary of the October Revolution had achieved a daily load of a thousand metric tons on each of their four longwalls. The leader in competition is the team of Hero of Socialist Labor K. Markelov, hoisting 3,500 metric tons of coal per day. This is 400 metric tons above quota. At the Don coal mine only 23 teams handle the daily thousand-ton load on the longwall. This has put the miners a week ahead of the production schedule since the beginning of the year. [V. Uzhakin] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 31 Aug 82 p 1] 6610

CHEAP FUEL--Raychikhinsk, Amur Oblast--A half-century has passed since work started on the development of Raychikhinsk coal deposit. Its mines are providing inexpensive fuel to many industrial enterprises and construction projects, collective and State farms in Amur Oblast and Khabarovsk Krai. The combine has won the everlasting praise of boiler rooms in the Far East. This combine has been awarded the Order of the Red Banner of Labor for their

appreciable contribution to solving the energy problems of the Far Eastern Territories. The coal beds of the miners' city of Raychikhinsk are nearing the end. But the mining fame of the combine will not diminish. Geologists have discovered and are thoroughly prospecting new deposits of brown coal. One of these, the Yerkovetskoye deposit, is bigger than those from which fuel is now being extracted. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 27 Aug 82 p 1] 6610

MINING REPORTS--The "Berezovskaya" mine, a new large shaft of the Podmoskovsk coal fields has started production. The State committee has put the facilities of a starting complex into operation with planned output of 750,000 metric tons of fuel per year. After completion of construction at the end of the five-year plan, the annual rated output of the enterprise will double. "Berezovskaya" is being built by a collective of the "Mosbass-shakhtostroy" Combine with consideration of the latest advances in Soviet science and engineering. The main slanting shaft 450 meters long has been driven through the rock stratum to the 110-meter depth, the vertical ventilation shaft, an auxiliary shaft and kilometers of mine rooms have been driven and firmly shored. [Text] The "Mikhaylovskaya" mine, the largest shaft in the Karaganda coal fields, has been named in honor of Hero of Socialist Labor Tusp Kuzembayev, deputy of the Supreme Soviet of the USSR of the first convocation. The prize in honor of Kuzembayev is considered one of the most distinguished awards in socialist competition among mines in the coal fields. In the "Karagandaugol'" Association two mines carry the names of other founders of the third coal stakehold of the nation--Ivan Kostenko and Korney Gorbachev. [Text] [Moscow PRAVDA in Russian 29 Aug 82 p 1] 6610

MORE MINING REPORTS--On the eve of Miner's Day, labor reports on achievements of miners in competition in honor of the sixtieth anniversary of the USSR are coming in from various coal fields. Novokuznetsk--The team led by V. Vladimirov from "Abashevskaya" mine has extracted the 500,000-th metric ton of coal since the beginning of the year ahead of schedule. This is the mark previously reached by the collective in a year. The speedup has been made possible by mastery of the first mechanized "OKP-70" high-capacity cutting complex in the mine. [V. Kladchikhin] Karaganda--Miners of the shaft imeni Gorbachev, the oldest mine in the coal fields, are celebrating Miner's Day with high marks in labor. The collective met their eight-month plan ahead of schedule. About 170 metric tons of fuel extracted above the quota goes to their credit. High work results have been achieved by sections led by V. Belik, V. Petrov, and Zh. Kozhakhmetov. They are all participants in the 500,000-ton competition. [B. Glotov] Tula--The State committee has put the new "Berezovskaya" mine into operation. The planned output of the first phase is 750,000 metric tons of coal per year. By extensive use of light metal structural components, subdivisions of "Mosbass-shakhstroy" Complex have erected the superstructure of the mine in a short period. "Berezovskaya" is the fourth mine put into operation in the Podmoskovsk coal fields in recent years. [I. Aryasov] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Aug 82 p 1] 6610

PIPELINES

CONSTRUCTION MINISTER DETAILS PIPELINE PROGRESS

Moscow PRAVDA in Russian 21 Aug 82 p 2

[Interview with Minister of Construction of Oil and Gas Industry Enterprises B. Ye. Shcherbina by the correspondents of TASS and APN; date and place not specified]

[Text] [Question] What is the current situation at the construction of the gas pipeline Urengoy-Pomary-Uzhgorod?

[Answer] The route which extends 4,451 km has already received 2,700 km of pipe. A total of 500 km of pipeline has been welded on the route. Up to 20 km of pipes are daily welded into lengths, more than 10 on the route. The calculated rates have been considerably exceeded. The basis for what has been attained and for increased advance of the plan is highly technical equipping of construction. Soviet industry has created effective and reliable equipment for working with pipes 1,420 mm in diameter under complicated conditions of the north.

The skill of the specialist, complete mechanization guarantee a continuous growth in labor productivity. Calculations show that for line operations on the gas pipeline, only 20,000 people are needed. The same number is needed for complete deployment of matters at all compressor stations.

[Question] Some agencies of U.S. information assert that the American embargo on equipment shipments for this trunkline will hold up construction for 2 years, and will force the Soviet Union to reduce construction of gas pipelines for domestic needs. What is your opinion on this subject?

[Answer] Transporting of gas on the pipeline will begin in January 1984.

I recall that the five-year plan stipulates construction of six large gas trunklines from the north to central regions of the country.

The gas pipelines Urengoy-Ukhta-Moscow and Urengoy-Petrovsk have already been opened. Work is being completed to construct the gas pipeline Urengoy-Novopskov. As labor resources and equipment are freed up on this object and they are sent to the Urengoy-Pomary-Uzhgorod trunkline, the rates of its construction will begin to increase.

Of course there will be no reduction in construction of domestic gas pipelines. Moreover, the sector has such potential that the possibility is currently being examined of constructing an additional seventh main gas pipeline in this five-year plan.

It is impossible not to stress that the builders of the gas pipeline are closely cooperating with the machine builders who have been obliged to supply in time the gas-pumping units, and at the same time guarantee start-up of the facility and the outlined schedule.

The assertions of some American information services that you have cited are either a consequence of a lack of knowledge about our potentialities, or a known lie.

[Question] Some information agencies of the West have shown reports that construction of the Urengoy-Pomary-Uzhgorod gas pipeline is using the work of prisoners. What could you say on this subject?

[Answer] Apparently the masters of disinformation are spreading more than one false rumor about this gas pipeline. There are no prisoners at the construction sites of the ministry as a whole, or on the gas pipeline Siberia-West Europe.

As I have already said, in order to solve such a large-scale task in a short time, it is necessary to have highly skilled specialists. In this case, this does not simply mean good workers, but experienced foremen of laying gas routes under northern conditions. At the construction site which the same Western journalists have called the "project of the century," precisely these personnel are working, workers, technicians and engineers with great experience. The overwhelming majority of them have more than 1,000 kilometers of gas pipeline construction behind them. I recall that in the country up to 2,000 km of pipelines of different purpose are annually opened, including field, with 5,000 km made of pipes 1,420 mm in diameter. In order to build them, it is necessary to have a good knowledge of the specific nature of the construction and to master complicated equipment, in a number of cases unique. The sector has many thousands of skilled engineers. The average age of the workers is about 30. The overwhelming majority of them have secondary education.

The success of the matter depends a lot on the high moral and ethical qualities of the builders. The collective of builders of the trunkline, unified, aware and friendly, is one of the leading teams of Soviet industry.

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PIPELINES

PIPELINE CONSTRUCTION PROGRESS REPORT GIVEN

Welding Begins in Tyumen

Moscow PRAVDA in Russian 13 Aug 82 p 2

[Article by V. Lisin, PRAVDA correspondent: "Urengoy"]

[Text] Slightly more than a month ago, the CPSU Central Committee and the USSR Council of Ministers approved a patriotic initiative by the collectives of the enterprises and organizations to guarantee timely opening of the main gas pipeline Urengoy-Pomary-Uzhgorod. The reports of our correspondents relate what the current situation is at the important construction site.

The settlement of Beloyarskiy appeared above the helicopter like an enormous white bird which had sat down to rest in the overflowing sea of the taiga. Here is one of the bases of the Tyumen builders of the main pipeline. The settlement is living a normal life: it is preparing for the winter season, welding large-diameter pipes on the stands, building compressor stations and pumping gas.

The subdivisions based in the Beloyarskiy trust "Kazymgazpromstroy" is erecting the compressor station at the Nobopskov "pipe" at intensive rates, triple the standard schedule. The builders are hurrying to pass as fast as possible to the new route corridor where they will lay the export trunkline: the first landing party on the platform of the future Verkhnekazymskiy compressor station which is 70 km from Beloyarskiy has already landed.

This fact is remarkable. It was suggested that foreign equipment be used namely at the Verkhnekazymskiy compressor station. In order not to reduce the work rates, the colleagues of the Donets "YzhNIIgiprogaz" quickly prepared new planning-estimate documents which were sent by airplane to Tyumen.

The trust "Kazymgazpromstroy" has been building compressor stations for almost 10 years already. Fifty of them are successfully operating. There are stations on domestic equipment, by the way, the majority of them, but there are also imports. The workers and the specialists of the trust install equally successfully both our machines and foreign ones. The most richest experience has been accumulated here. The builders are working on the minimum schedules.

Several years ago, because of the lack of roads, life on the route came to a standstill in the summer. Now on almost all the thousand-kilometer Tyumen branch of the trunkline which stretches from the Urengoy tundra to the rocky spurs of the Ural Mountains, work is boiling. Five hundred kilometers of route have already been cleared and field cities are being erected.

The Tyumen workers are already welding the pipeline in three places. One of the first to begin laying the trunkline was the famous collective headed by USSR State Prize Laureate B. Diduk from "Severtruboprovodstroy." On the unstable log roads and in the clouds of swamp blood-sucking flies the experienced specialists have already connected into a line the first kilometers of pipes in the Yamal tundra. This is the very beginning of the route. Slightly to the south, already in the taiga, the welding columns of "Priob'truboprovodstroy" are working. On the little known stream Amne, using the spring floods, all that was necessary was brought in in order to lay 30 km of finished trunkline. The swamps which are impassable in the summer season do not allow the collective of the SU-20 to do more. On the other side of the Ob, closer to the tops of the Urals, another subdivision of this same trust, SMU-61 is working on the trunkline. About 90 km of trunkline will be laid during the summer, Glavsibtruboprovodstroy reported to us.

"This is a lot," said the head of the Tyumen central board N. Kurbatov. "Nevertheless our main work is in winter when the heavy equipment can travel on the route. Even now we have compiled for each of the twelve production lines of the transcontinental trunkline a detailed schedule with monthly breakdown. It is planned to finish the work on the line section of the gas pipeline in March of next year. This is earlier than planned."

Gas Pumping Station under Construction

Moscow PRAVDA in Russian 13 Aug 82 p 2

[Article by R. Sabirov, PRAVDA correspondent: "Pomary"]

[Text] A considerable part of the trunkline which will provide an invaluable gift of Siberian oil-natural gas to the center of the country, to the western boundaries of the country, passes over the territory of the Tatar and Mari Volga region.

A freshly cut clearing leads to the construction platform. Here everything is new. On the 3-kilometer road bed, without waiting until it is covered with reinforced concrete plates and is asphalted, trucks are already hurrying back and forth. A temporary housing city has been erected for the builders in which there is everything needed for normal work and daily life: both heat and hot water supply, a cafeteria with snack bar, and a sports complex. Here the workers of the mobile mechanized column from trust No 7 of the production association "Tatneftestroy" have based themselves. They are faced with building a powerful compressor station for gas pumping here, not far from the Mari settlement of Pomary.

"Pomary is the intermediate station of the trunkline," relates the chief engineer of the mobile mechanized column G. Zakirov. "It is hardly the most powerful of the 43 compressor stations that it is planned to build on the entire length of the enormous route. Here it is planned to install machines of import production. But the administration of the United States has decided to disrupt our plans."

It did not happen! The collective of the Leningrad association "Elektrosila" started to fabricate powerful high-quality machines for our and dozens of other stations. The example of the Leningraders was followed by many other domestic enterprises. Soviet equipment will be no worse than the American and will arrive at the construction site on time and ahead of schedule.

However replacement of the machines requires redoing of the projects, there is nothing to be done. There is nothing to be done here. But reports are already coming to Pomary from Donets and Leningrad: the specialists of "YuzhNIIgiprogaz" and the Leningrad institute "Giprosbetsgaz" have been obliged to finish ahead of schedule all the work associated with planning the Pomary gas pumping station.

The work rates are high. A concrete solution assembly, systems of heating and water supply for the housing in the city are being rapidly constructed. The administration of mechanized operations is conducting vertical planning of the platform for the future gas pumping compressor station.

"A lot has been done," adds the bulldozer operator G. Krylov. "In two months we have removed over 28,000 m³ of ground. Next is driving in the pilings under the foundation of the main building."

It is also lively at another platform where the workers from the section of the trust "Tatnefteprovodstroy" are laboring. They are faced with digging trenches and laying 71 km of pipes from the Tatar aul of Bishnya to the shores of the Volga.

"The pipes have already arrived," reports the foreman of the section A. Bychkov. "The route has been outlined. The equipment is here. Now we will finish equipping the semiautomatic stand for welding pipes of large diameter and will start laying the trunkline."

At the platform of the Tatar aul Biryuli precisely the same test stand has already started to operate. Over 30 km of pipes have been welded into lengths.

Swamp Vehicles Created

Moscow PRAVDA in Russian 13 Aug 82 p 2

[Article by A. Kurkov, PRAVDA outside correspondent: "The Swamps Did Not Interfere"]

[Text] The local plant "Ukhtagazstroy mash" has started to manufacture new swamp-traveling (on wide caterpillar tracks) trailer pipe length carriers PTG-251

which are extremely needed by the builders of the main gas pipelines. This machine is capable of shipping to the route on marshes and bogs a 36-meter pipe length made of pipes 1,420 mm in diameter weighing 25 T. The trailer is transported by a swamp-traveling tractor. The pipe length carrier from No 1 has been sent to the route workers by Glavkomigazneftestroy. The builders of the gas pipeline Urengoy-Pomary-Uzhgorod are also receiving them.

The plant "Ukhtagazstroy mash" which in May marked the first anniversary of its existence, is manufacturing highly passable wheeled pipe carriers with load capacity of 25 T based on the tractor K-701. Now another innovation is being mastered here which the builders of the underground gas rivers are already waiting for. This is the mobile eight-station electric arc welding unit AS-81. With its help butt joints of large diameter pipes can be connected under field conditions immediately by eight welders. The first of these units have already been sent to Tyumen to the builders of the gas pipeline Siberia-West Europe.

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PIPELINES

TURKMENISTAN GAS PIPELINE CONSTRUCTION PROGRESS OUTLINED

Ashkabad KOMSOMOLETS TURKMENISTANA in Russian 3 Aug 82 p 2

[Interview with Viktor Andreyevich Talday, delegate to the 26th CPSU Congress, head of the all-union industrial association "Turkmengazprom" by outside correspondent Yu. Vetkalov; date and place not specified: "Who 'Plays' on the Pipe and Why?"]

[Text] The length of the main gas pipelines of our country exceeds 130,000 km. This is the world's largest system of transporting blue fuel. An important role in it is given to the gas extracting complex of Turkmenistan which today by right occupies one of the leading places in the USSR. Here in Karakumy, the known gas pipeline Central Asia-center of the country begins. The steel arteries become more powerful and filled with each year. This was predetermined by the selfless labor of the explorers of the depths who reveal new promising fields, and the efforts of the builders and operators, each of which strives to do the maximum at his work place.

As is known, in recent years the self-named opponent of our gas workers has become none other than the president of the United States of America, Mister Reagan. He apparently cannot bear that the blue fuel extracted in the country of the Soviets will enjoy greater demand abroad and not in words, but in deed is becoming a symbol of peace and friendship on the European continent. Thus the especially economic concepts "gas and pipes" have now acquired an especially pronounced political tone and have been translated into an important frontier of struggle for further strengthening and development of detente.

The contribution of the gas workers of Turkmenistan to this struggle, the course of their fulfillment of the assignments of the 11th Five-Year Plan is discussed today by the delegate to the 26th CPSU Congress, head of the all-union industrial association "Turkmengazprom" Viktor Andreyevich Talday who responds to the questions of our outside correspondent Yu. Vetkalov.

[Question] What is the gas extraction complex of Turkmenistan and what is its role in the country's energy balance?

[Answer] The blue fuel which is currently extracted in Karakumy enters the unified system of gas supply of the USSR. It is natural that it directly participates in the export supplies. Being an integral part of the entire gas extracting complex of our country, Turkmenistan intensively continues to increase the detected reserves and to extract this universal raw material which powers plants and factories, is widely used in daily life, and serves as an irreplaceable original material for the chemical industry.

The 26th CPSU Congress has set before us a great and important task of bringing gas extraction in the republic by 1985 to 81-83 billion m³. Our republic will strengthen even more its position as second after the RSFSR gas extracting base of the country. For this purpose a target comprehensive program has been developed and is successively being implemented. It includes measures for exploring new promising gas provinces, the most rapid build-up and start-up of fields of blue fuel. An example is the famous Dauletabad field which is located in the foothills of Badkhyz. It was discovered in the previous five-year plan. Now drilling out of areas and construction of the production base is going at full speed. A lot of work lies ahead. Its goal is in the beginning of 1983 to already guarantee supply of blue fuel of Dauletabad to the gas pipeline "Central Asia-center of the country." I am confident that the plan will be implemented on time and the Turkmen gas, as before, will pass to the consumers precisely on schedule. In this case the export shipments in no way will affect the satisfaction of the current needs of the population and the national economy of the country.

[Question] What difficulties are encountered on the path of our gas workers? How essentially do they feel the effect of the ambitious actions of Reagan's policy?

[Answer] The work of the gas workers has always been difficult. It has become even more labor intensive and complicated now when they have to reach the underground storehouses through loose sand which is difficult to pass through, groundless waters, and populated areas. Each time they have to create again the necessary social structure in uninhabited places, lay roads, build housing, start up production facilities. Making wells is also generally done under extremely complicated geological-technical conditions. This requires from our drillers highly professional skill, great civil courage and persistence. There is a similar situation with the actual extraction of gas. The blue fuel of Karakumy has a whole series of admixtures which make additional requirements for the work of the operators. But they have good quality domestic equipment which is capable of successfully solving the developing problems and successfully competes with similar mechanisms of foreign firms.

Thus the attempts of Mister Reagan to play a solo on the pipe and to interrupt the mutually advantageous "gas-pipe" contract is nothing else than a false note.

It is remarkable that the actions of Reagan have not found support even in the West among the traditional partners of the United States for conducting a rigid course of anti-Soviet policy. There can be no doubt that the efforts of Reagan to undermine the mutual confidence of the interested parties will not be successful, and the notorious Reaganomics will not work even here, as it did not work in solving many other international problems from which the United States wanted to extract benefit in a unilateral order.

[Question] At the same time it is impossible to be complacent? The gas workers, like all workers of the republic need to observe a strict regime of economy and conservation and to rely more broadly on initiative and experience of the leading workers of production?

[Answer] This is precisely the situation in the gas industry of the republic. For effective protection, for example, of the fittings of the gas wells inhibitors are successfully being used, different chemical additives to the gas. They have been developed in our country and are good protection for the pipes from the effect of an aggressive medium. The gas pipelines are also protected by special materials. This increases their service life, improves stability in high temperatures, etc. The efforts of our efficiency experts and inventors who are persistently searching for reserves so that the developments may be introduced more rapidly into daily practice are constantly aimed at improving the service life of the equipment.

[Question] What will be the response of the gas workers of the republic to the improper intrigues of the White House?

[Answer] The gas workers as a whole are successfully fulfilling the outlined program. The other day, for example, the field at the Molla-Kera field which is in the Maryy Oblast was opened and the separator compressor station at the Achak field was started up.

The socialist competition of the workers which has developed in the sector is yielding good results. It is occurring under the motto "60 shock worker labor weeks for the 60th anniversary of the formation of the USSR!" Two boreholes and one brigade of underground and major repair of wells have already fulfilled the assignment for the second year of the five-year plan. These are the collectives of Ch. Charyyev from "Shatlykgazdobycha," M. Khaydarov from the Chardzhou administration of exploratory drilling and Ya. Kaminskiy from the South Turkmen administration of exploratory drilling. A total of eight labor collectives are now working on the 1983 schedule. In addition, over 30 subdivisions of the sector have reported the fulfillment of the plan for the first 6 months ahead of schedule.

This year it has been decided to extract in addition to the plan no less than 650 million m³ of gas.

[Question] What is the role of the Komsomols and the young people in implementing the outlined plan?

[Answer] There are many young people working in the system "Turkmengazprom." They have been entrusted with decisive sections of our production. For example, the brigade of drillers headed by the expert A. Ogonyan from Achak order "Sign of Honor" administration of drilling operations enjoys good fame. It has fulfilled the assignment for two and a half years by the day of opening of the 19th Komsomol Congress. On the right flank of socialist competition is the Lenin Komsomol Prize laureate for 1981, delegate to the 19th Komsomol Congress, diesel motor driver V. Popov. In May of this year a group of our operators for gas extraction participated in the international watch "Friendship." The accumulated knowledge and experience are now being successfully used by them at home, and they are attracting their comrades in work by their personal example.

By persistently achieving labor victories, the gas workers of Turkmenistan, like all the Soviet people say with one voice: "We will answer your actions with pipes Mister Reagan!"

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PIPELINES

GTN-25 GAS PUMPING UNITS BEGIN SERIES PRODUCTION

Leningrad Leningradskaya Pravda in Russian 9 Jul 82 p 1

[Article: "GTN-25: Series Production Begins for the Gas Trunklines of the Country"]

[Text] Assemblies and parts for the first series gas-pumping units with power of 25,000 kW have been put into production ahead of schedule in the associations "Nevskiy zavod" imeni V. I. Lenin and "Leningrad Metal Plant." Realization of the target program for the most rapid increase in output of machines needed for timely start-up of the main gas pipelines has begun, and in the first place, the export Urengoy-Pomary-Uzhgorod. The Leningrad machine builders who were one of the initiators of the patriotic initiative of creating this transcontinental route, approved by the CPSU Central Committee and the USSR Council of Ministers decided to finish fabrication of the first series unit GTN-25 in December of this year.

The new machines whose main samples have recommended themselves well in tests make it possible to accelerate production of the gas trunkline extending over 4,500 km. Their use at the compressor stations together with the currently employed units of 10,000 kW reduce the volumes of construction-installation operations.

In order to master production of the new equipment, Leningrad has again used the experience approved by the CPSU Central Committee of the labor cooperation of the creators of the Sayano-Shushensk GES. New creative cooperation has been set up which has coordinated the efforts of 20 associations, enterprises, planning, design, scientific research and construction organizations. As a counterweight to the discriminatory measures taken by the U.S. administration, production of powerful machines has begun.

In order to master series production of units, the association "Nevskiy zavod" has expanded in-house metallurgical production. The 39th trust of Glavzapstroy [Territorial Main Administration for Construction in Western Regions of the RSFSR] is erecting a framework 20,000 m² in area. The trust Lengazspetsstroy together with the subcontracting organizations is beginning to lay on the bottom of the Neva towards connection of the special gas pipeline which is needed for testing machines directly at the enterprise. The units will be sent to the construction site in complete readiness. The new equipment is being put into operation in the associations "Leningradskiy zavod turbinnykh lopatok," and "Leningradskiy metallicheskiy zavod."

The collectives of the associations "Kirovskiy zavod," "Izhorskiy zavod," "Krasnyy treugol'nik" and other enterprises of the city have reviewed their plans, adopted additional socialist commitments and have also started fulfillment of the orders of the creators of GTN-25. Practically all the organizational problems have been solved and the competition which is broadly developing at the city enterprises will be an insurance that the series output of the new gas "transporters" will be mastered in the noted schedules.

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PIPELINES

YELETSK COMPRESSOR STATION CONSTRUCTION COMPLETED EARLY

Moscow IZVESTIYA in Russian 6 Aug 82 p 1

[Article by V. Komov, in-house correspondent of IZVESTIYA: "Ahead of Schedule"]

[Text] The Lipetsk builders have completed construction of the powerful gas compressor station "Yeletskaya" on the route of the Urengoy-center of the country gas pipeline in 9 months instead of 18.

The first teams of builders and the first mechanisms and machines appeared quite recently 10 km from the ancient Russian city of Yelets. Construction of one of the main gas-compressor stations has already been completed. During these months, 2,500 m³ of precast and monolithic reinforced concrete were laid, 1,500 T of metal parts were installed and a lot of complicated equipment.

These results were no accident. The facility which is very important and urgent was entrusted to the general contractor, Order of the Red Banner of Labor trust "Lipetskstroy" whose experience was recently approved by the CPSU Central Committee.

"Honestly speaking," said the secretary of the CPSU obkom V. Lokotunin, "it was very complicated for the trust to fulfill this assignment. The fact is that the collective is coordinated and highly skilled. For all the years it has been involved in building metallurgical facilities: blast furnaces and rolling mills. This should also be said about the collectives of the 12 subcontracting subdivisions of the Ministry of Installation and Special Construction Work who actively participated in the construction of the station. They worked 100 km from their home base. But because of the experience, skill, labor enthusiasm and creative initiative, the assignment was successfully implemented with considerable advance of the schedule."

Here they worried in advance about the creation of the necessary living conditions for the workers, the organization of effective labor competition at all the sections, and carefully verified engineering preparation of production. Thus, the experience of by-assembly organization of work, installation of pipelines by enlarged blocks was successfully used. Precast reinforced concrete designs of foundations under buildings and equipment were widely used.

Work was done here round-the-clock. As soon as the slightest malfunctions were found, the headquarters immediately took decisive measures. When we conversed with the group of builders and installers, many of them said: "This is our response to the loud 'bans' of the American president. We have one more station to build soon. We believe that we will build it even faster. The transcontinental gas pipeline will inevitably be opened on time."

We are standing in an enormous compressor shop. It rises almost 30 meters. In the pipe hall and the hall of heaters everything is attractive because of its good quality, reliability and power. After a short time, the operators will start up this completely automated complex which was born in the year of the 60th anniversary of the USSR. It is symbolic that the workers from many cities from a number of fraternal republics have helped to erect the station.

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PIPELINES

GAS PIPELINE CONSTRUCTION BOOK REVIEWED

Moscow MOSKOVSKAYA PRAVDA in Russian 12 Aug 82 p 3

[Article by V. Semenov: "Gas-Pipelines"]

[Text] Comrade L. I. Brezhnev has called the construction of the five largest main gas pipelines West Siberia-center of the country and the export gas pipeline Urengoy-Uzhgorod the central construction site of the five-year plan. The total length of this transport trunkline which does not have analogs is 20,000 km (half of the equator). The power of the 356 compressor stations exceeds 24 million kW (this is 4 Krasnoyar GES's). The cost is R 25 billion (this is more than the outlays for construction of BAM [Baykal-Amur Trunkline], KamAZ [Kamsk Automobile Plant], VAZ [Volga Automobile Plant] and Atommash together).

These data are from a recent book "Gas-Pipelines."* Small in size, it is an interesting and information-packed story about the central construction site of the five-year plan. This story is not only interesting, but it is also instructive, in particular, to those who are attempting to use different types of "sanctions" to obstruct the development of our economy and mutually advantageous cooperation between the USSR and the West European countries.

It takes the Urengoy gas 100 hours to travel the 4,500 km and reach Uzhgorod on the western border of the USSR. But the builders had to pass swamps, make crossings over 561 rivers, and cross the Urals and Carpathians. Pipes sent by our partners from the FRG are already arriving. Builders from the GDR are participating in the work: in the Ukraine they are faced with erecting several compressor stations, houses as well as sections of the trunkline itself. They will use the experience which has justified itself in laying the gas pipeline "Soyuz": then builders from Hungary worked here.

Construction is being done primarily on the bases of Soviet equipment and technology. Thus, heavy pipe-layers are being used from the Sterlitamak plant which are not inferior to the known American machine "Caterpillar" whose shipments were cut off by the U.S. administration. In the Siberian swamps the builders are being helped by the swamp vehicles "Tyumen" which

* "Gas-Pipelines." A story about the central construction site of the five-year plan, "Izvestiya," 1982.

traversed those sections where the imported all-terrain vehicles sank. The complex "Sever-1" which does not have equals in efficiency is being used for welding (firms of the United States and Japan have acquired licenses for the method of electric arc welding which it uses). The first 300 km of gas pipeline in the polar regions will be laid from unique multiple-layer pipes which withstand increased pressure: their production technology has also been developed in the USSR and they will be manufactured at our plants. The Leningrad workers and engineers are developing series output of powerful and economical gas-pumping units GTN-25 in unusually short times. They are not at all inferior to those turbines whose export to our country Washington is trying to block.

The builders are obliged to complete almost 800 km of the line section of the gas pipeline by the 60th anniversary of the formation of the USSR. The entire trunkline should open in 1984.

The Soviet builders are counting on their enormous experience. In their time they have laid a gas pipeline 1,500 km long from Urengoy to Chelyabinsk in 1 year. The United States took 6 years to lay a pipeline 1,300 km long under similar conditions in Alaska.

This book presents some of those thousands of letters that the newspaper editorial staff, construction trusts and organizations have received and they contain the same request: send us to the gas pipeline construction. "Our brigade is set to work on the most difficult sections of the gas pipeline," writes, for example, the driver of heavy machines Z. Akhmetov from Tajikistan. These letters are the best proof that the grand construction site has not only a reliable technical base.

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PIPELINES

EXPERIMENTAL MULTIPLE-LAYER PIPES WELDED

Moscow IZVESTIYA in Russian 31 Jul 82 p 1

[Article by Yu. Perepletkin, in-house correspondent of IZVESTIYA: "Installation of Multiple-Layer Pipes Has Begun"]

[Text] In the Berezovskiy Rayon, not far from the settlement of Beloyarskiy, welding of an experimental section of the gas pipeline made of multiple-layer pipes of domestic production has begun.

Work on the line is being done by the specialists of the SMU-25 from the trust "Priob'truboprovodstroy." We went to the site with the deputy head of the trust I. Gomonov where the brigade of communists A. Bragin was connecting the heavy three-link lengths.

Unusual heat from the north was complicating the already difficult work of the welders. But every member of the collective recognized the importance of the experiment that they were participating in.

"A multiple-layer pipe," says the deputy head of the SMU-25 Yu. Konoplev, "has many advantages, of which the main is the ability to withstand pressure of 100 atmospheres and more. This will make it possible to pump one-third more blue fuel on the gas pipeline of the same diameter as before. In the chief section of the export trunkline Urgenoy-Uzhgorod, multiple-layer pipes extend for hundreds of kilometers. But first we had to find all the features of the innovation here on our experimental section."

Four layers of metal sheet welded into a spiral comprised the body of the pipe. The sleeves, the ends, to put it more simply, are monolithic and welded together without any special complications. This is how it essentially turned out. The welders are working confidently and without interruption, however there are differences from the accustomed technology.

"Now it is necessary to make not four-five passes over the outside for each junction, but nine," explained P. Gashenko, the chairman of the Institute of Electric Arc Welding imeni Ye. O. Paton who joined the conversation. "The double number of seams prolonged the work for each junction by 1-1.5 hours. There are also other changes: the route for the multiple-layer pipes has to be prepared using a different technology, and more pipe layers are needed for lowering the pipes into the trench."

In the foreman's shop where the entire brigade had assembled, a conversation started about the ban of the Reagan administration on the shipment of equipment for the export gas pipeline. The workers with one voice proclaimed that the threats from across the ocean only give them strength and a desire to work faster and better. The guarantee of success is the "worker's relay race," integrated competition of hundreds of production collectives.

The brigade left the foreman's shop. Everyone took their places. The gas burners began to hum, heating the ends of the pipes. Their edges came closer together, and steel clamps of the centering device held the junction more strongly. Now the edges were closed. The sparks of the welding which were blinding even in the clear July afternoon immediately flared up.

Fulfilling the decree of the CPSU Central Committee "Work of the Ministry of Construction of Oil and Gas Industry Enterprises for Technical Re-equipping and Introduction of Progressive Methods of Construction," the specialists of the trust "Priob'truboprovodstroy" are performing an experiment whose value is difficult to exaggerate.

At the same time, on the shore of Kazym, equipment is being accumulated in expectation of a barge. This is the beginning of the transfer of the trust subdivisions to those points where they have to construct the export gas pipeline Urengoy-Uzhgorod. Everyone is full of desire to lay the steel channel for the gas river to West Europe exactly on schedule and with high quality.

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PIPELINES

LARGE-DIAMETER PIPE WELDING UNIT DESCRIBED

Kiev PRAVDA UKRAINY in Russian 30 Jul 82 p 2

[Article by A. Maliyenko; "Units for Gas Pipelines"]

[Text] The Institute of Electric Arc Welding imeni Ye. O. Paton of the Ukrainian SSR Academy of Sciences received a telegram from Surgut. It said that the unit "Sever-1" had been sent to Kiev.

This unit is the first of the new equipment designed for welding large-diameter pipes. Ten years ago the scientists of the institute were involved in developing this unit. The first experimental sample was ready in 1974. It was used to connect a steel length of the gas pipeline "Soyuz." Then the unit was sent to the northern Tyumen Oblast where the Vyngapur-Chelyabinsk trunkline was constructed. Now, after several years of work, "Sever-1" is coming back.

The specialists in the sector for introducing pipe-welding complexes of the institute imeni Ye. O. Paton have a unique work place: somewhere between the office and the workshop. It is more likely that both have been combined. Next to the chairs and desks there is a work bench where vises have been attached: here there is a drilling machine, tools and parts have been set up. It should be said that the colleagues spend most of their time not in the institute, but at the test site, where new units are tested, and at the gas pipeline route. The sector was set up not so long ago, before this a group of specialists was involved in developing the technology for contact-butt-joint welding of continuous melting. Although the first complex "Sever-1" has already been serving for a long time, this welding equipment even today does not have foreign analogs.

"The set of electric contact welding is constantly being updated," says the head of the sector, Lenin Prize laureate S. A. Solodovnikov. "We are searching for possibilities of improving the reliability of the unit assemblies and are striving to set up the technology better. Participating in the construction of five gas pipelines already, 'Sever-1' seems to have acquired experience: some shortcomings found during the work have been eliminated in it."

One can judge how much more advanced the machine has become by comparing the experimental sample with the recent series-produced units whose output the Pskov plant of heavy electric welding equipment recently mastered.

Whereas on the first complex, the pipes were centered in 10-15 minutes, this operation now takes only 1-2 minutes. The productivity of the machine has been enhanced 1.5-2-fold, it welds up to seven butt-joints in an hour. We note that the highly skilled worker manually can weld no more than one butt-joint per shift.

The units "Sever-1" will help the builders of the gas pipeline Urengoy-Uzhgorod to greatly accelerate the rates of building the trunkline. The complex is designed for operation under conditions from -40 to +50°. As we see, the range is fairly broad. The builders have already obtained new units. The institute specialists are helping in the adjustment of the equipment. The experimental plant which manufactured the experimental sample "Sever-1" has now started manufacturing spare parts for these units.

"As for the very first unit which can already be called a veteran, it will still serve us," continues S. A. Solodovnikov. "We are thinking of using the complex for studying the working processes and experiments. By the way, it has a younger brother "Sever-2." This unit will connect butt joints of pipes 1220 mm in diameter. A month ago it successfully passed tests. Now the institute is involved in developing a universal machine for welding pipes from 1020 to 1420 mm in diameter. Searches are underway for the possibilities of mechanizing pipe welding on curved sections of the route. This will permit the manual labor of the welders to be completely switched to the shoulders of the machines."

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PIPELINES

PIPE LENGTH CARRIERS SHIPPED TO TYUMEN

Baku VYSHKA in Russian 5 Aug 82 p 2

[Article by V. Korin: "Pipe Carriers for Tyumen "]

[Text] To the question of how the work is going, the young mechanic Nasib Aliyev who was replacing the brigade foreman these days, cheerfully answered:

"Everything's in order, we are coping with the monthly assignment."

But when we were walking through the narrow passage of the shop where almost everywhere you turn you are stepping across sheets of rolled metal, and we passed to the blacksmith's section, I found that it was not so simple to achieve high output under these constricted conditions. The production areas of this shop are very much in need of reconstruction and expansion. However the brigade of Yuriy Yelin that was recommended to me in the party committee of the machine construction plant imeni V. I. Lenin is constantly overfulfilling its planned assignments. The 6 month plan was completed by the assemblers with good indicators, 110 percent. In addition to the main program, they also fulfilled the program for output of items of mass consumption: supports for refrigerators and folding machines.

The machine construction plant imeni V. I. Lenin is comparatively small in the association "Soyuzneftemash," but it is associated with many enterprises. Over 80 plants and enterprises supply it with items on contract bases, and it in turn, supplies the plants imeni Lieut. Shmidt and imeni B. Sardarov, as well as the Groznyy enterprise of oil machine construction on a cooperative base. Its main product is pipe carriers and pipe length carriers. Today they are going to all the fraternal republics. But mainly, these machines are going for the construction of the Siberian-West European pipeline.

The brigade of Yu. Yelin from the preparation shop has been given a large role in the coordinated rhythm. More than 100 names of parts which will be assembled into assemblies and units of the pipe carriers are being manufactured by the assemblers of this collective. The stands, safety plates, generator frames, and casings go from here to the assembly shop, and it can be considered that the brigade of preparers "supplies" the entire plant which manufactures 75-80 types of carriers per month.

The difficulties of its work are rising: they have just succeeded in mastering the output of pipe carriers based on the chassis ZIL-131 and the plant will begin to set up output of these machines based on KrAZ this year. But the brigade has assembled people who do not stop before difficulties.

I had the opportunity of hearing about the special "Yelin" style of work. The fact is that a worker dynasty is laboring in this brigade. The father, boiler maker Nikolay Yelin, worked here for over 40 years, and upon retiring gave the brigade foremanship to his son Yuriy Yelin. His other son Anatoliy is working in the same brigade.

I was not able to meet with the brigade foreman himself, he had gone on vacation, but judging from how skilfully his replacement Nasib Aliyev was organizing the work, one could understand that he had been well trained by the brigade foreman.

"Our brigade has started a shock-worker watch in honor of the 60th Anniversary of the Formation of the USSR," said the candidate for membership into the party Nasib Aliyev. "The 38th week was dedicated to the workers of transport, including pipe carrier transport. These days we are working in a special way, intensively. By the end of the week we had supplied 75 sets of equipment for the pipe carriers. We will work with the same high productivity in the new shock-worker week dedicated to the builders."

It should be noted that since the beginning of the year the plant workers have sent to the Glavtyumen'neftegaz 33 new pipe carriers. The plan for shipping the finished product has been fulfilled ahead of schedule.

A day before I came to the plant, there was a party meeting there at which the decisions of the May (1982) plenum of the CPSU Central Committee were discussed. Nasib Aliyev related how he and his comrades are striving to make their own worthy contribution to solving the food program. Many years of patronage have connected the plant workers and the workers of the kolkhoz imeni Nasibov of the Belokanskiy Rayon. The machine builders are supplying the kolkhoz workers with pipes, roofing shingles, electrical equipment, and are actively participating in the construction of a new parking area for agricultural equipment.

"The fellows from our brigade," Nasib expressed the common opinion, "have decided to visit the kolkhoz and to help with their personal labor those under their patronage."

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PIPELINES

FIRST PIPE SHIPMENT ARRIVES IN YAMAL

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 1 Aug 82 p 1

[Article by A. Vinogradov: "Caravans Travel Through the Ice*"]

[Text] The motorboat "Dmitry Donskoy" came to Novyy Port with the first caravan of ships that delivered freight of this year's navigation on the northern sea route to Yamal. There were 850 large diameter pipes in its hold, supplied by the West German firm "Mannesman" on the "gas-pipes" contract for the builders of the main gas pipelines West Siberia-center of the country, including the export line Urengoy-Uzhgorod.

The Komsomol-youth crew of "Dmitry Donskoy", one of the best in the Murmansk marine steamship company is constantly among the leaders of the socialist competition.

I ask the senior assistant to the captain Sergey Kuznetsov to talk about the last trip.

"The port workers of Bremen guaranteed rapid loading of the ship, in only 2 days, despite the fact that we had to carry pipes with plant insulation requiring especial accuracy in loading and unloading operations. We generally have a precise business contact both with the representatives of the firm, and with the administration, and the port workers. This is not the first year we have been working together. This is why we understand the powerful wave of dissatisfaction with the irresponsible sanctions by the American president to reduce shipments of machines and equipment for construction of the Urengoy-Uzhgorod gas pipeline. The short-sighted actions of Reagan are primarily a blow to thousands of workers and employees in the enterprises of the Western countries who cooperated in the construction of the export trunkline from the Tyumen north. They would be threatened with unemployment if there was an interruption in the construction."

The northern sea section of the route was passed under the guidance of the nuclear powered vessel "Lenin." A very unpleasant ice situation developed at the entrance to the Ob Bay. The advance was restrained by last year's shore ice up to 2 meters thick which drastically changes the direction of the wind.

*A story of heroic endurance soon to be an NBC mini-series.

The ice breaker had to do a lot of work. But they got through and then cast anchor at the outside roadstead of Novyy Port.

Having taken the relay race from the sailors, the river workers of the Irtysh steamship company in a short period under complicated conditions worked five shifts, having unloaded onto barges about 20,000 T of pipe. There remains a total of over 20,000 T of large diameter pipe to ship from the ports of West Europe to the region of Novyy Port in the 1982 navigational year. This is more than 300 km of the main gas pipeline.

When our helicopter made the final circle above the region of unloading, "Dmitriy Donskoy" was ready for a new trip. The silhouette of "Komsomol'tsa Estonii" appeared on the horizon, this was the first transport from the second caravan. These ships are given good marks everywhere.

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